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Steam Fire Engines.

The Philadelphia "North American," says: "We learn from good authority that a joint committee of the City Councils have accepted a proposal made by Mr. Harrison, an eminent and wealthy engineer and machinist of this city, to construct, upon a plan of his own, a steam fire-engine which shall answer the purpose designed at least as well, if not better, than the engine now in use in Cincinnati. If the apparatus, when completed, should prove upon trial to be what the inventor predicts, it is to be accepted by the City Corporation, and put in use forthwith for the extinguishment of fires. We are further informed that the engine is now in course of construction at one of our machine establishments, where the extensive facilities afforded will ensure its rapid completion. This is a movement in the right direction, which will be hailed with pleasure by the mass of our citizens."

Parian Marble.

Consists almost entirely of carbonate of lime, and is much softer and more transparent than that of Carrara. The term marble is applied to those fine varieties of granular and compact limestone, which being of a closer grain, are susceptable of a superior polish, and are remarkable for their whiteness, their blackness, or the beauty and varieties of their colors. Blue and green marbles frequently owe their tints to minute particles of hornblende. The black varieties are colored by carbon, and sometimes by bitumen.

Tin in California.

It is said that a tin mine has been found near San Francisco, by some workmen in the employ of the "Mountain Lake Water Co.," while tunneling through a hill near the Presidio. The Cornwall mines in England are now the principal and almost the only source from which the world derives this metal. Next to iron and copper, tin is the most useful of metals, and is the most generally employed in the arts. It is employed in covering iron plates to make the sheets used for kettles and pans, and also by practical chemists in making coloring mordants.

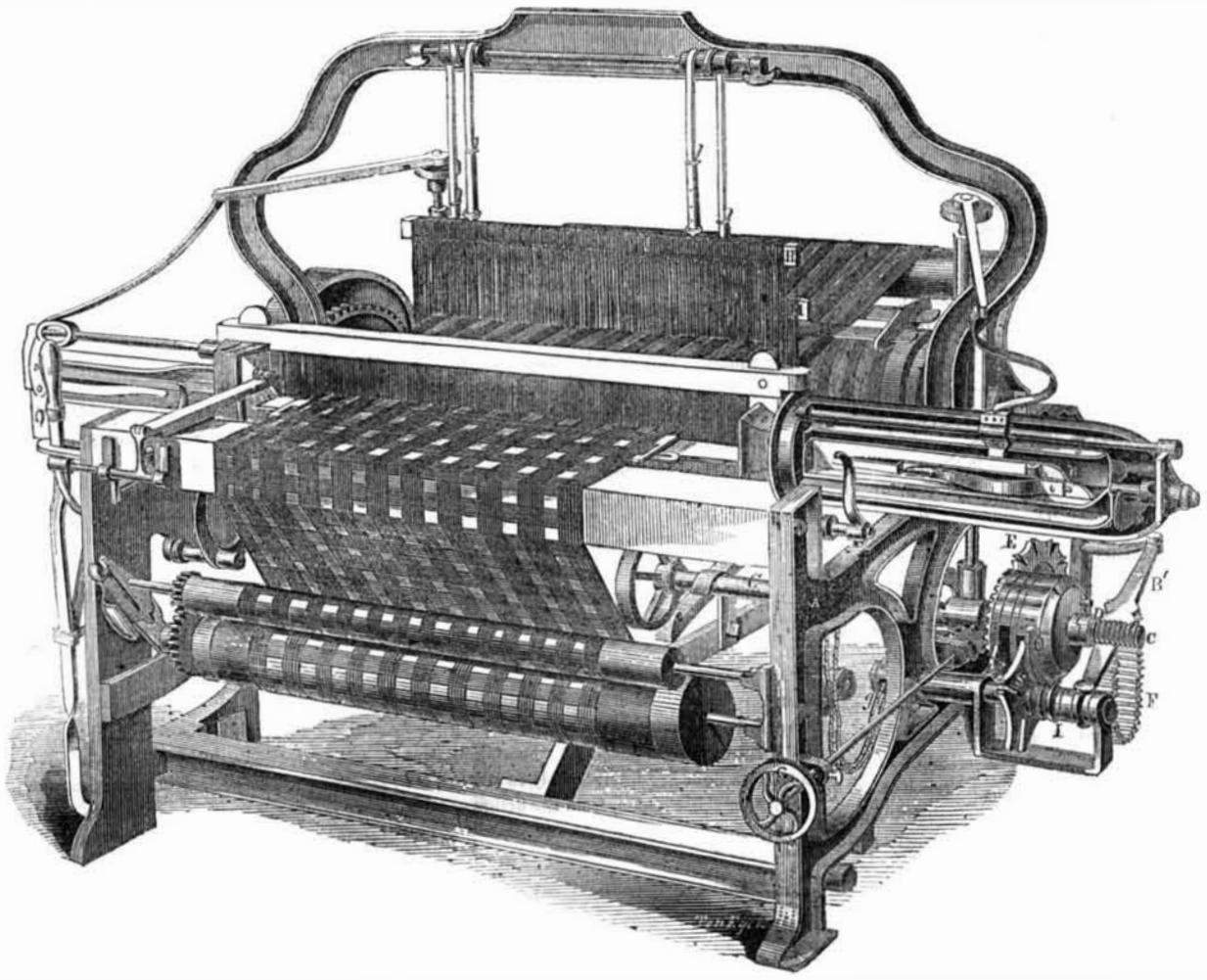
Missouri Hemp.

The increase of receipts at St. Louis over last year, in this important staple, foot up about 14,324 bales, making an aggregate of 63,450, against 49,124 for 1852. When to this is added the enhanced rates at which this article sold, (a considerable portion of the crop bringing as high as 20 per cent advance on the sales of the previous season,) a money balance in favor of the present year may safely be estimated at from $200,000 to $300,000.

The Timber Seized since July 1, on the Wisconsin and Chippewa rivers, as having been feloniously cut on Government land, amounts to sixty million of feet, and is valued at from $250,000 to $500,000.

Wrecks at Key West.—Twenty-eight vessels were wrecked on the Florida Reef during the last year, and twenty-nine arrived in distress.—Estimated loss $2,082,500.

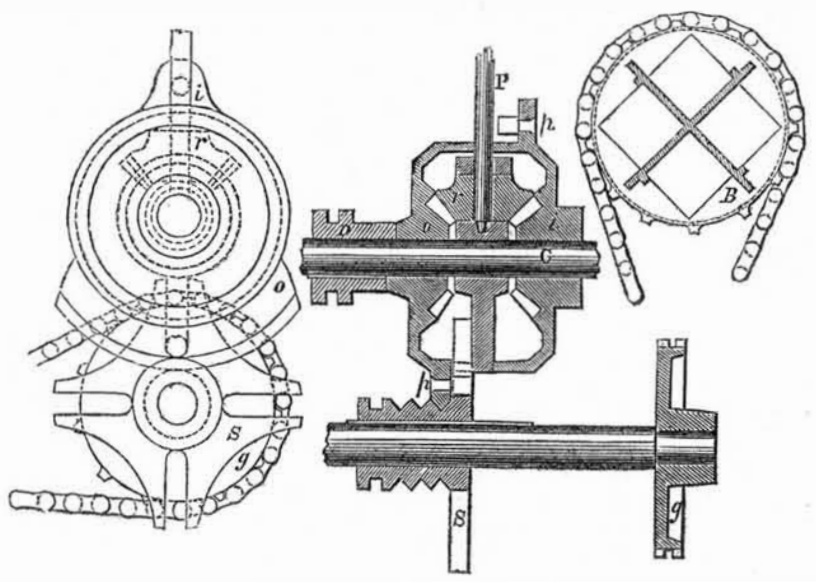
ECCLES' PATENT CHECK LOOMS.---Fig. 1.



The annexed engravings are views of Eccles' Patent Power Loom for weaving checks or ginghams; this loom is manufactured by that distinguished and extensive company "Ames Manufacturing Co.," Chicopee, Mass., James T. Ames, agent.

Figure 1 is a perspective view of the loom; fig. 2 is a sectional elevation of the compound motion for operating the shuttle box. Fig. 3 shows the gearing driven from the cam shaft, C, with which it is coupled by the clutch, D. Fig. 4 is a section of the shuttle box, B, with the chain, *g*, around its sprocket wheel, for the purpose of shifting the shuttles to throw in the desired weft as the star wheel, S, is operated by the pattern chain shipper. The general outline and parts of the loom are the same as those in common use, and need not be described. H H are the heddles; B is a revolving shuttle box; C is the common cam driving shaft; O is gearing which couples with said shaft, by the clutch, D, and which communicates motion

Figure 2. **Figure 3.** **Figure 4.**



from the bevel wheel, *r*, to the one, *i*, which runs in an opposite direction to O. P is a stay pin, which carries the gear, *r*, and causes the reverse motion of O and *i*. S is a peculiar star wheel on the small shaft, I. On a pulley on the inner end of said shaft, there is an endless chain, *g*, which passes between two small pulleys on the loom frame, and finally around the sprocket wheel, which is secured on the inner end of the revolving shuttle box, B. It will therefore be observed that the shuttle box will be operated just as the star wheel, S, is moved. There are four slots in said star wheel, and there are pins, *p p*, on the gearing, O *i*. As these pins revolve with the gearing they catch in the slots of the star wheel, and move it one quarter each time a pin catches, and by means of the chain, *g*, operate the shuttle box. The pattern chain, F. has pins secured on its links. This chain has a continuous positive motion from the shaft, C, by the star wheel, E, around the shaft of which it passes. The pins in chain F are not shown, but it is sufficient to say they are set in links, such as one pin at one side of a link for one color, another pin at the center of the next link, say for white or a neutral color, and a third pin set on the other side of a third link, for a different color; strictly speaking, however, there are only two kinds of pins on the pattern chain. These pins, as they come round, take into notches on a shipper or sword, B', which has a prong end grasping the collar of the star wheel, S. This lever, therefore oscillates, and shifts the said collar of wheel S on its shaft further in or out—just the required distance—to bring the slots of the star wheel, S, into the exact position, to be caught by either of the pins, *p p*, or to be set on the neutral point between these two by the neutral pins mentioned, so that these pins may revolve and *not* catch into the slot of the star wheel, S, when required. Each change of the shuttle throws in two picks, but according as the pins are set on chain F, any required number of picks of one color can be thrown in. The great improvement claimed for this loom, is the gentle and easy motion of shifting the colors of the weft. There is no jarring, as in the pin wheel loom but all works soft and smooth.

When there is a mistake made in the picks, a small pinion on the inner end of the shaft of G, enables the weaver to bring back the gearing to its proper connection to correct the mistake. There is a series of notches on a collar on the small shaft, I, as seen in fig. 3, into which a bevel edge on O takes and holds the

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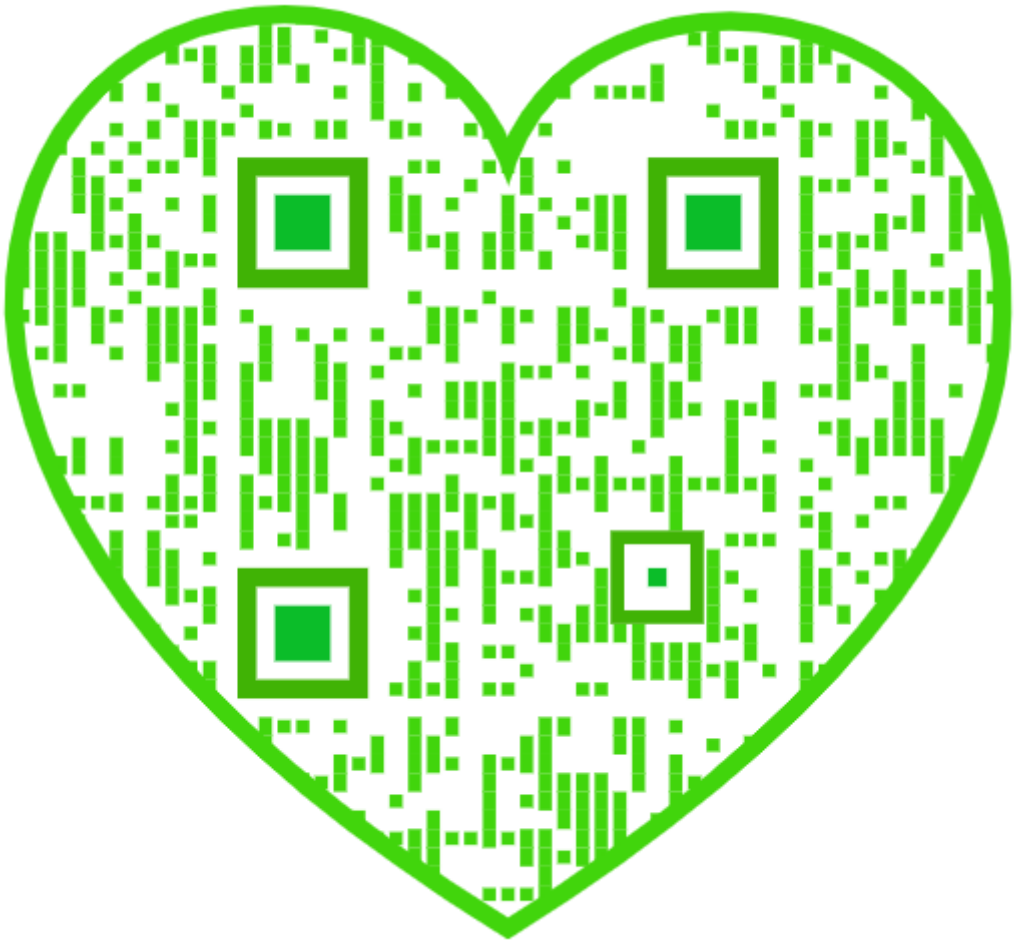
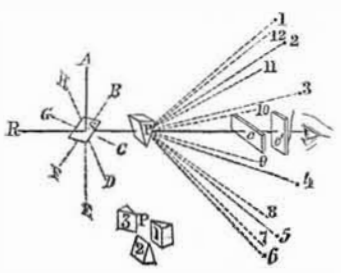


star wheel, S, in its proper position. The shuttle box—by this plan of operating it—can be made to revolve entirely, or make a semi or quarter revolution and rotate back again. Two such shuttle boxes can also be placed on one loom—one on each side.

There is neither spring, catch nor weight connected with the machinery, or operating the boxes. The links of the pattern chain can be painted and arranged together, just as the colors are wanted in the cloth, and these will be observable by the weaver at all times. Such a loom can be built in a very substantial manner, and from the ease of its motions, it is not liable to be broken in any of its parts. It can also be run at a high speed, because there must be less breakage of weft than on looms, which shift the boxes with a quick jerking motion.

More information may be obtained by letter (or otherwise) addressed to Mr. Ames, as above directed. This loom was awarded a silver medal by the Jury at the Crystal Palace.

Imponderable Agents.---No. 8.
[Second Series.]



Polarization of light.—This is one of the most extraordinary properties of light, and in the hands of opticians, it has recently become one of the most useful branches of optics, the phenomenon however, is not generally understood; it does not mean that a ray of light has two poles, like those of a magnet—a polarized ray of light, simply means, a *difference of sides*. The phenomenon of the polarization of light was discovered by M. Malus, a French officer of engineers in 1809. The double refracting property of Iceland spar, which had been so carefully examined by Huygens, drew also the attention of Newton, who concluded that the ray which suffers the unusual refraction must have its opposite sides affected by some virtue like magnetism, which gives them a tendency like magnetism. Malus in one of his frequent visits to the observatory during his residence in Paris in 1809, was struck with the brilliant reflection of the setting sun from one of the windows of the Luxembourg palace. On looking at the appearance through a prism of rock crystal, which he slowly turned round, he saw with surprise, that one of the images changed regularly from brightness to obscurity; next morning he repeated his experiment with the same results, and soon found that light reflected at a certain angle from the surface of the glass, acquires the same character as the extraordinary ray in the double refracting prison. This law was traced through various reflecting surfaces, but the career of Malus was cut short by a lingering disease in 1812.

That a ray of light should (in some cases) possess this property is not perhaps so wonderful or unexpected as that man should have been able to detect a fact so refined and remote from common observation, and even to distinguish different varieties of it, and investigate its laws. Indeed, these must be regarded as the very *penetralia* of physics, the very inmost secrets of nature that man has been enabled to wrest from her. If the *mensurable* spaces occupied by the *waves* of light be minute, how far less, in all probability, must be those *immeasurable* spaces to which its vibrations are confined (which even in sound are mostly inappreciable, though the waves occupy many feet); yet it is to the positions of these inconceivably minute vibrations that the differences of polarization are due.

Differences of *intensity* depend on their extent; differences of *color* on their frequency; differences of *polarization* on their form and direction.

These differences are not sensible to the eye, but are arrived at by inductive reasoning from facts like the following. Let R, fig. 1, represent a ray of light, which in its progress meets (obliquely) with the surface S; a portion of it will be transmitted, and the rest reflected in the directions S. A. Now, by making S revolve round an axis coincident with the ray, R, S, we may obviously reflect it in various directions successively, as S B, S C, S D, S E, S F, S G, S H, all making equal angles with the original ray R S; and, if this be destitute of polarity, there is no reason why it should behave differently when reflected in these different directions, nor will a direct ray from any luminous source do so. The reflected light will bear the same proportion to the transmitted in each case; so that all the rays S, A, S B, &c. will be of equal intensity.—But if we find that they are *unequal*, the transmitted ray being *brighter*, and the reflected one *fainter*, when the latter is turned in the directions S B and S F (for instance), than in the directions S D or S H, we have distinct proof that this light has *sides*, or is *polarized*.

Or suppose we turn the ray aside by *refraction*, as by a prism P. By turning this prism round so as to take successively the positions shown in the lower part of the figure, at P. 1, 2, 3, we may plainly turn the ray upwards, downwards, or sideways, in any of the directions *p* 1, *p* 2, *p* 3, *p* 4, *p* 5, *p* 6, *p* 7, *p* 8, *p* 9, *p* 10, *p* 11, *p* 12, (the refraction in each case being equal). Now, if it behave differently in these cases; if, for instance, it be refracted doubly, or split into *two* rays of *equal* intensity when turned upwards or downwards, and into two of *unequal* intensity when turned to the right or left, its polarization is thus manifest.

Or again, if the eye receive this ray through a plate of some transparent substance *c*, and if more light penetrate this plate when it is held upright, as at *c*, than when held across as at *c* (though in both cases perpendicular to the ray,) we plainly learn from this not only the polarity of the *light*, but also that of the substance *c*, which must evidently possess a *grain* or polarity of texture, a difference of properties in different directions; and accordingly this action on light is perceived only in *crystallized* bodies, or those which, from the action of their molecular forces, assume certain definite geometrical forms, and whose *polarity* is also manifest in many other ways, as by their splitting in certain directions rather than others, their expanding by heat unequally in different directions, &c. &c.

General Scientific Memoranda.

Bohemian Crystal Knives.—Among the various novelties prepared for the new year, and in which the shops of Paris abounded were fruit knives of Bohemian crystal; the blade of white crystal, and the handle a happy mixture of white and blue, or white and claret colors.—Hitherto silver knives have been thought indespensable for fruit; but this crystal novelty is likely to supersede them; they are not only an ornament for a dinner table, but are more easily kept clean and bright than silver.

Fall of a Suspension Bridge.—The Suspension Bridge, uniting the cities of Covington and Newport, Ky, just erected at a cost of $80-000, and whose entire destruction by falling into the river in consequence of the breaking of the keys, had, as is stated by the Cincinnatti "Commercial," just been taken off the hands of the contractors by the towns, and a toll gate established. Its capacity of resistance was never tested before the job was taken from the contractors, a neglect quite unpardonable.—When the bridge fell, a drove of cattle were upon it near the centre, while the driver doubting the security of the bridge, stood at a little distance, on the Newport side, and watching his cattle, saw them take the dizzy plunge, amid crashing timber and iron, into the icy river.

Manure Irrigation in Agriculture.—Mr. Mechi, of Tiptreehall farm, Essex, England, has this year read at the Society of Arts his annual statement of experiments on the poor land he has been farming at Tiptree. This land, when he took it, was of the most meagre kind, and nothing like repaid the expense of cultivation. Mr. Mechi has drained it, irrigated it, manured it, employed all the improved machines, erected buildings for the cattle, has been at great expense, and has adopted all the newest improvements, even to the American threshing machine. The result has been that last year—a bad year for weather—after paying all expenses, he is the gainer of $3,000 in hard cash, and his estate is worth ten times what it was when he took it. He enlarged much upon the immense improvement in grasses obtained by liquid manure, and expressed his wonder that ships should be sent to a distant land, and $50 a ton paid for guano, when a far better fertilizer was to be had at home. He instanced a piece of pasture land, of his own, which eighteen months since was a wretched piece of plastic clay, producing meagre drab colored grasses. It was like bird lime in the winter, and iron in the summer, and really not, and never had been, good for any thing. Irrigation with liquid manure has changed all this, and now it produces the very finest and most fattening grasses, the importance of which may be understood when Professor Way, in his valuable analysis, stated that irrigated grasses contained 25 per cent more meat making matter than those which are not irrigated.

The difference between the present and former Balance Sheets, lies in the live stock accounts. By irrigation he is enabled to double, if not triple, his green and root crops, and thus renders them highly profitable instead of being unprofitable. By doubling his stock he doubles the quantity of manure. And by doubling his green and root crop he diminishes their cost by one-half. Irrigation permits each crop to be responsible for its animal charge, thus rendering them all remunerative.

Breech-Loading Cannons.—A final trial of Dr. Church's breech-loading cannons has been made at Woolwich, England. They were fired fifty times with heavy charges of powder and ball with perfect success. No defect could be pointed out by the best judges. According to this plan, heavy guns can be loaded and fired and brought into position by two men five times in a minute, and field pieces eight times in a minute. The gun heats but very little.

Glass Columns.—The Prussians have put glass to a novel use. A column, consisting entirely of glass, placed on a predestal of Carrara marble, and surmounted by a statue of Peace six feet high, by the celebrated sculptor Rauch, has been erected in the garden of the palace at Potsdam. The shaft is ornamented with spiral lines of blue and white.

Marine Telegraph Cable Across the Hudson.—A new cable of telegraphic wire made by Messrs. Newell & Co., at Gateshead-upon-Tyne, England, has been laid across the Hudson River from Fort Washington to Fort Lee, by order of Mr. Rogers, Superintendent of House's New York and Washington telegraph line. The cable contained a single conductor of No. 16 copper wire, covered with two coats of gutta percha, and wrapped with rope yarn, forming a core, over which are spirally laid eight No. 10 galvanized iron wires, as a metallic covering, to protect the enclosed copper conductor. It weighs 3,525 pounds, is three fourths of an inch thick, and one mile in length. It was unrolled from a capstan on board the steamboat Delaware.

There are about one hundred steamers lying side by side at the Cincinnati levees, some frozen in by the ice and others aground. Cargoes are taken on board, so that the shipper may get a bale of lading and the advances upon it. The cargoes are insured when put on board.—Two things endanger these vessels and their freight. Fire breaking out in one would be likely to sweep the whole, and on the breaking up of the ice by high water, they are in danger of being sunk, as numbers were two years ago.

Two mammoth steamers are building in Buffalo, to run in connection with the Michigan Central Railroad route on the opening of navigation. They are estimated to cost $500,000 each, and are to be named the "Plymouth" and "Western World."

Vastness of the Universe.

Professor Hitchcock, in one of his popular scientific works has aptly illustrated the vastness of the Universe. Light, although apparently visible instantaneously, really requires an appreciable time to travel. A flash of lightning, occurring on earth would not be visible on the moon till a second and a quarter afterwards; on the sun till eight minutes; at the planet Jupiter, when at its greatest distance from us, till fifty-two minutes; on Uranus till two hours; on Neptune till four hours and a quarter; on the Star Vega, of the first magnitude, till forty-five years; on a star of the twelfth magnitude till four thousand years.

Extraordinary Invention.

Messrs. Editors—While we are every day hearing of new inventions and the progress of reform, I take the liberty to state to the readers of your valuable journal what I have invented and am about to bring before the world at the earliest possible period. For the last four years I have had my mind engaged upon a marine locomotive, and I have succeeded in bringing it to nearly a perfect plan, it is unlike anything now used in navigating the ocean: one of its most important features is the remarkable fact that it has no head-water resistance—thus the speed can be increased in the same ratio as we increase the number of revolutions. I make these statements candidly, and my object is to open the way to give my invention a public demonstration, and if any one has any invention of the same kind, embracing the same principle, let him make it known now, and not wait until the thing is before the public, and then come forward and claim it as his own. If any one has invented a locomotive that will cross the Atlantic in four days without any head-water resistance—let him speak now; if not, let him forever hold his peace, for I have such an invention, and am ready to prove my statement to any one who will address me postpaid.

Henry A. Frost.

Worcester, Mass., Jan. 18, 1854.

[Since the above letter was in type, Mr. Frost has furnished us with diagrams of his astonishing invention, from which we shall execute engravings to present to our readers in a few weeks.

To Detect Cotton in Linen.

Elsner has published a critical review of the various methods proposed to distinguish cotton and flaxen fibres (Berlin. Industrie u. Handelsbl. xxiv.), the best of which we extract from his report. Stockhardt observed that a flaxen fibre, inflamed in a vertical position, and then extinguished, appeared to be carbonized at that end in a smooth, coherent shape, while cotton, similarly treated, appeared to be spread out like a brush or tuft. Elsner observes that it especially occurs when the flame is violently blown out, and that it succeeds with dyed goods, unless dyed by chrome yellow.

The potash test consists in putting the fibre into boiling caustic potassa-lye for a couple of minutes, when the flax turns deep-yellow and the cotton is scarcely changed. The test is not reliable.

One of the best is the microscopic examination, for when flax is magnified 300 times, it appears like long, compact tubes, with a narrow channel in the centre, while cotton appears to be flattened, ribbon-like cylinders, with a wide channel, and mostly in spiral windings.

The test with oil of vitriol is reliable in an experienced hand, but every trace of weaver's gum must have been previously removed by boiling with water. The fibre are laid on a plate of glass, and oil of vitriol dropped on it.—A single lens is sufficient to observe the effect. In a short time the cotton fibre is dissolved, the flax unalterated, or only the finest fibres attacked.

The oil test is also a good one, and convenient in execution. When flaxen fibres are rubbed up with olive-oil, they appear transparent, like oiled paper, while cotton, under similar circumstances, remain white and opake.—Dyed goods exhibit the same, if previously bleached by chloride of lime.

Elsner's method consists in putting the fibres for a few minutes into a tincture of various red dyes, of which cochineal and madder give the most striking results. The tincture is made by putting 1 pt. madder, &c, into 20 pts. common alcohol for 24 hours. In the cochineal tincture, cotton is colored bright-red; flax, violet;—in madder, cotton becomes light-yellow; pure flax, yellowish-red.

It is better to employ several of these tests, the microscopic, oil, sulphuric acid, and combustion, rather than to rely upon a single test.

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[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING JANUARY 21, 1854.

COPYING PRESS.—By Calvin Adams, of Pittsburg, Pa.: I claim the combination of the lever, bar and upper pressing plate, connected by means of the adjusting screw, and the mode of communicating pressure to the upper pressing plate by means of a cam at the end of a lever, working at the end of a lever bar which sustains the upper pressing plate, also the use of the finger at the end of the cam lever in combination with the rest and other parts of the press for the purpose of raising the upper platen of the press and sustaining it in its place while the copying book is inserted or withdrawn as set forth.

WOOD SAWS.—By Romeo Andrews & Albert F. Andrews, of Avon, Conn: We claim the peculiar form and relative position of the planing teeth in combination with the sawing teeth, as set forth.

RAILROAD CAR BRAKES.—By L. B. Batcheller, of Arlington, Vt.: I claim operating the levers which are attached by two rods to the cross bars, L M, by means of vibrating bars C C, said bars C, being moved or operated either by turning the standards E E, or by the action of the buffer-rods upon the two levers, both devices being attached to the trucks and otherwise constructed and arranged, as set forth.

DUMPING CARS.—By C. P. Bailey, of Zanesville, Ohio: I claim hanging or connecting the bodies of dumping cars or wagons to the trucks, axles or bolsters, which usually support the bodies of similar carriages, by means of hinged cross braces or arms which pass transversely from end to end, or crosswise of the body as the case may be, one end of each of said arms or braces being hinged to the body and the other ends to the bearing or support beneath them, for the purpose of allowing said bodies to swing or dump either way, as described.

FANCY CHECK LOOMS.—By Enoch Burt, of Manchester, Conn.: I claim hanging the levers or jack lifters below the web and on a shaft parallel with, and at or about a verticle plane with the "fell" or cloth making line so as to produce an even shed both at the top and bottom and render the shifting of the jacks from the said levers sure, avoiding the jar of the machinery and obviating the liabilities of the jacks to hang on the flanges of the levers, as set forth.

ROSIN OIL LAMPS.—By Silas Constant, of Brooklyn, N. Y.: I claim enclosing the portion of the wick which rises above its guide, within a perforated conicle tube M, for the purpose of causing a portion of the air that enters the chamber beteen G and H, to be brought in contact with the wick which is there in an uncompressed state, and to rise in and about the same to the flame, as set forth.

Second, I claim the draught tube placed within the burner, and having the button and the perforated and deflecting head conbined therewith, substantially in the manner and for the purpose herein set forth.

Third, I claim the lip projecting downwards from the under side of the cap within the series of air holes in the same for the purpose of preventing gusts of air from producing puffs of smoke up the chimney, as set forth.

WASHING MACHINES.—By Wm. Cunningham, of Holliday's Cove, Va.: I do not claim the general features of the rubbing frames and plunger; but I claim the roller frames hung in adjustable boxes and connected by weighted arms, as described.

BEE HIVES.—By John H. Dennis, of Boston, Mass: I claim a moth trap consisting of a close chamber, having no communication with the rest of the hive and in which may be placed a vessel containing some fluid attractive to the bee-moth, in combination with a conical or tapering entrance tube, as set forth.

ATTACHMENT TO PIANOFORTES.—S. B. Driggs, of Detroit, Mich.: I claim, first, the combination of a series of metallic tongues or springs with the pianoforte or other stringed instrument, in such a manner that a tongue and a string are struck simultaneously by hammers actuated by a single key, as described.

Second, actuating the hammers which strike the tongue, by means of a jack of any suitable form, attached to the damper of its corresponding string, whereby the said hammer is caused to strike by the raising of the damper, when the pianoforte action is brought into play, and thus the tongue and string are struck simultaneously.

AIR-HEATING FURNACES.—By C. R. Harvey, of New York city: I do not claim a diving flue, or a coil of heating pipe, as they are both well known devices; but what I do claim as my invention, is constructing the bonnet or top of the fire chamber, with a depression at the centre, into which the smoke or exit pike enters, so that the heat is equalized all around and the expansion and contraction is made uniform, as specified.

STOVE.—By D. G Littlefield, of Lowell, Mass.: I claim the cylindrical grated fire pot in combination with the gas receptacle constructed and operating in the manner substantially as described, by which I am enabled to burn the gaseous and more inflammable elements of the coal in immediate contact with its more refractory portions and thus ensure the complete combustion of them both.

VENTILATING RAILROAD CARS.—By George Neilson, of Boston, Mass.: I claim two or more ranges of sponges or capillary partitions as arranged and combined with the cistern of water and open mouthed case made to communicate with the interior of the car and the surrounding atmosphere and to operate when the car is in movement, as specified.

HOLLOW SLABS AND FLANGED METALIC PLATES.—By Thomas Prosser of New York city: Although I have used the term wrought iron, I mean to apply the same to all and any of the weldable metals particularly steel and platinum, that I do not confine myself to any particular form or configuration by the term hoop or ring, as that may mean annular, round, square, oval or any irregular form whatever.

What I claim is the manufacture of hollow slabs when the same are made by welding together pieces of metal as described, or in any manner analogous thereto.

I also claim the manufacture of flanged metallic plates when the same are made by welding together pieces of metal in the manner fuliy set forth.

FEED APPARATUS OF STRAW CUTTERS.—By Harvey Trumbull, of Central College, Ohio: I claim the device for securing the clear passage of the straw &c. over the intervals between the trough and mouth piece and the lower roller, consisting of fingers attached to the trough, and passing over the said roller into or upon the mouth piece. secure from interference with the passage of the straw &c. by grooves in the face of the roller in which the fingers lie.

MILLS FOR GRINDING SUMAC.—By Peter and W. S. and J. J. Hench, of Port Royal, Pa.: We do not claim the grinding by balls as that has long been known, but not in conjunction with a roller in the manufacture of sumac, which is necessary to detach and partially pulverize and slit the material before carrying it to the balls.

We claim the employment of a cylinder having projecting points or teeth on its internal surface with a roller having heads on its ends, on which it rolls and is kept above said teeth, said roller also having teeth projecting from its surface interlocking with those first named on the cylinder by which the better portions of the sumac are beaten off and passing through the apertures in the cylinder enter another when they are ground fine, as described.

MACHINERY FOR FULLING CLOTH.—By J. H. Jennings and Thomas Brierly, of Clayville, N. Y.: We do not claim the individual parts thereof, nor the combination of the gatherer and horizontal and vertical rollers or fold breakers with a cylinder or wheel or cylinders or wheels having a groove therein or flanches on each side and a cylinder or wheel fitting and working in such groove or between such flanches nor the weights and springs to be used upon any or all of such rollers or fold breakers and pressure rollers, but we claim the named rollers formed with flat surfaces in combination with the gatherer the horizontal and vertical rollers or fold breakers and guide, as set forth.

PISTON VALVES AND STEAM PASSAGES IN CYLINDRICAL STEAM CHEST.—By Joseph Marks, of Boston, Mass.: First, I claim constructing a steam chest with continuous circular ports or passages, both for the induction and exhaust steam, arranged as herein above described so as to keep a constant and equal pressure of steam upon both ends and the periphery or outer surface of a cylindrical piston valve which travels in the bore of the same, and by which also is secured a large area of port by a very small movement of the valve, and this I claim whether the said valve be used as a main valve "cut off" or throttle valve.

Second, I claim the combination of a piston valve composed of two heads, which fit closely in the bore of the circular steam chest and are united by a cylindrical portion of less diameter than the said heads with a steam chest constructed with circular ports or passages as specified, in the foregoing claim, by which a large exhaust space is secured without increasing the size of the said steam chest or making it very large, and by which means alone provision is made for the escape of the exhaust steam into the exhaust chamber.

THRESHERS AND CLEANERS OF GRAIN—By James Robinson, of West Hebron, N. Y.: I claim the mode of checking the motion of the carriage when under headway, and steering the same by means of the tightening pulleys combined as described, with the threshing cylinder and a two wheel cart with double gearing.

I also claim the employment, in the manner described, of the adjusting rods in combination with the feed roller for the purpose of regulating the amount of material to be taken up by the feed roller, as explained.

I also claim the employment of said adjusting rods in combination with the feed roller and threshing cylinder for the purpose of regulating the amount of material to be taken up by the feed roller and of keeping up the material to the threshing cylinder.

I also claim the combination of the adjusting rods, feed roller, and gauge rods, substantially in the manner herein above set forth.

I also claim the combination of the gauge rods, with the feed roller and concave or mouth of the concave of the threshing machine, substantially, as described.

PIANOFORTES.—By Alexander Hall, of Lloydsville, Ohio: I do not claim the employment of extra strings or extra bridge or bridges for the introduction of the lower octavo notes as they are set forth in the patent of Simeon Draper granted June 20, 1845, in which an extra bridge is used outside the regular bridge, thereby elongating the instrument.

I claim, first, the mode substantially as described, of introducing upper octave notes in pianofortes, said mode consisting essentially in the employment of extra strings and extra bridges as set forth, so that the performer can play in one or more octaves at the same time with the same facility as he could execute ordinary music on the common piano.

Second, I claim the arrangement of the dampers for the octaves, in combination with the alternate changes of the two upper octave strings to the right and left of the the leading strings in each set, for the purposes set forth.

ATTACHING SHAFTS TO WAGONS.—By Daniel Haight Jr., of Clinton. N. Y.: I claim attaching the shafts or tongue by the lateral insertion of the cylindrical headed draw iron into the circular socket of the jack, by which I am enabled to form a safe and ready detachable connection between the shaft or tongue and axle without the use of bolt and nut or bar or any intermediate means.

MACHINE FOR WETTING PAPER.—By William Overend, of Cincinnati, Ohio: I claim, first, the yielding gauges constructed as described.

Second, the combination of the endless bands, the nippers, the roller M, the rollers U U, and their bands the roller Y, with its bands and counterbalance, the carriage with its verticle arm, the pieces, the bent levers and the cams constructed and combined substantially as described, for taking the wetted paper from the blanket and conveying it to the movable platform, as set forth.

Third, the combination of the sliding pieces moving in the vertical grooves with the arms and the rollers, constructed and combined substantially as described, for adjusting the depositing apparatus to the height of the pile of paper.

Fourth, the combination of levers with the roller and curved groove, arranged substantially as described, for maintaining a uniform tension of the bands in every position of the depositing apparatus.

GRAIN HARVESTERS.—By Aaron Palmer, of Brockport, N. Y., and Stephen G. Williams, of Janesville, Wis.: We do not claim the discharging the cut stalks and heads of grain from a platform, by means of the combination of a rake with a lever, and the co-operation therewith of a series of teeth on the face of the main driving wheel, and an inclined rail rising above the curved guard of the platform, as these are already secured to us by letters patent.

But we do claim the method of transferring motion to the rake on the platform from the driving wheel, by means of the double curved rack and pinion on the axle of the driving wheel, the iron arm, latch and spring, as described.

Also, the method of hanging the reel so as to dispense with any post or reel bearer next to the standing grain, as herein described, thereby preventing the grain from getting caught and held fast between the driver and a reel supporter.

ROLLING AXLES AND SHAFTS.—By Jacob Reese, of Sharon, Penn.: I claim the method of shaping bars of heated iron into axles and shafts of the usual proportions, and with collars and journals, by rolling them on their own axes and under pressure between properly shaped converging surfaces, substantially as described, but I make no claim to mere converging surfaces, whether fixed or movable.

THRESHERS AND SEPARATORS OF GRAIN.—By C. R. Soule, of Fairfield, Vt.: I claim, first, the spring at the end of the feed board, to prevent damage from stones getting into the machine; secondly the straw carrier and separator, consisting of the notched bars having an endway motion, and the beater as specified, combined with the moveable conducting board for insuring the descent of the grain.

I also claim the mode of hanging and moving the shoe, as described.

MACHINE FOR MAKING WINDOW BLINDS.—By M. C. Stiles and Tristram S. Lewis, of Hollis, Maine: We do not claim the cutter, chisel or any part of the machine separately; but we claim the combination of the cutter and chisel worked simultaneously by the foot of the operator or by other power, in the manner set forth.

DISTILLING APPARATUS.—By Carl E. Werner, of New Castle, Ill.: I claim, first, the rim rising from the floor of the chamber and encircling the discharging opening of the conducting pipe for prevention of the interference of steam with the discharging action of said pipe.

Second, surrounding the entrance of the conducting pipe with an open tubular screen which rises above the pipe entrance to a height greater than any possible ebullition of the liquid, and terminates below at such portion of the liquid as it is desired to discharge from.

MORTISING MACHINE.—By J. E. Brown and Stephen S. Bartlett, of Woonsocket, R. I.: We claim operating the chisel by the graduated conical cam, in combination with the mechanism described, or its equivalent, which enables the operator to vary the length of the stroke made by the chisel while it is in operation or suspend its motion at pleasure without disconnecting the driving power applied to operate the machine.

REISSUE.

PORTABLE HORSE POWERS.—By J. A. Taplin, of Fishkill, N. Y. Patented originally, Dec. 30, 1841: I do not claim the making of the large wheel of a horse power in segments merely, but I claim such wheel and axle composed of a number of parts arranged and connected as described, so that the wheel can readily be taken apart and put together again, to facilitate the frequent removal of the horse-power from place to place to bring it near the work on which it is to be used.

I also claim connecting the segment of the rim of the horse-power by means of clamps constructed, as set forth.

DESIGNS.

DINING ROOM STOVE.—By Conrad Harris and Paul W. Zoiner, of Cincinnati, Ohio.

COOKING STOVE.—By Conrad Harris and P. W. Zoiner, of Cincinnati, Ohio.

SHOVEL AND TONGS.—By Charles Zenner, of Cincinnati, Ohio, assignor to M. Greenwood & Co., of same place. Two designs.

NOTE.—A number of the patents in the above list were secured through the Scientific American Patent Agency.

Recent Foreign Inventions.

MANUFACTURING PAPER.—Geo. Stiff, of London, Eng., patentee. In carrying out his invention, the patentee makes use of straw, or grass, "gunney bagging," and "hemp bagging," preferring however, the employment of straw.—When straw, grass, or vegetable fibre of any similar kind is employed, the first process made use of is to cut the straw or fibre into lengths of about half an inch,—which may be done in a chaff-cutting machine or any similar apparatus heretofore employed for the purpose; after which, the straw or fibre is winnowed, by any suitable contrivance, in order to separate the knots and other portions of the fibre which could not be readily reduced to the consistency of pulp. The straw or fibre, thus treated, or the gunney bagging, or hemp bagging, after having been suitably prepared, is placed in a boiler or vessel, together with a sufficient quantity of clear water to cover the fibre or other material, and boiled for the space of one or two hours. This boiler or vessel is furnished with partition or diaphram, finely perforated, or composed of gauze or similar material, through which the water may be drained off from the fibre or other material, and carried away through a discharge-pipe, which is brought into connection with the lower surface of the boiler or vessel. After this process, the fibre or other material is to be immersed in lime-water, in the proportion of about 1 cwt. of lime-water to every cwt. of material, and to remain so immersed for the space of about 24 hours, the mixture being occasionally stirred. After the expiration of this time, the-lime water is to be drained off, and a fresh solution poured on, which is again drained off, as before. When this operation has been continued during about three days, the fibre or other material is to be placed in water, to which alkali has been added, in the proportion of about 10 lbs. of alkali to every 1 cwt. of water, and boiled for the space of two or three hours; the alkaline solution is then drained off, in the manner before described. After the fibre of the material has been thus treated, it is washed and bleached in the same manner as when bleaching rags; that is to say,—by running it into tanks or vessels, with a quantity of chlorine or bleaching powder, sufficient to bleach it to that degree of whiteness which is required for the quality of paper to be made. After being thus bleached, the straw or other fibre or material, may be washed and beaten, and reduced to pulp or half stuff, in the usual manner; and the pulp or half stuff may be converted into such paper as shall be required by the process heretofore in use.

The patentee claims the substitution of lime-water for other alkaline solutions heretofore employed in the maceration of straw, grass, or other vegetable fibre, or gunney bagging, or hemp bagging, used to form the pulp or half stuff, in the manufacture of such descriptions of paper as are produced from the aforesaid materials.—[Newton's London Journal.

FIRE-PROOF PAPER—E. Maniere, of London, patentee. This invention consists in applying asbestos to the manufacture of paper. The asbestos is rendered very fine and pulpy, and mixed along with the pulp of rags.

Tanning Cotton and Linen.

English and French fishermen have been long in the habit of tanning their sails, &c. in bark liquors, in order to render them more durable. Miliet states that pieces of linen, treated for 72 hours with an oak bark liquor, at 150°, and stretched on frames, remained unaltered in a damp cellar for 10 years; while untanned linen in the same place and for the same time had entirely rotted. The one frame, also tanned, was perfectly preserved, and the other, untanned, had rotted. It was further shown that linen, which had began to moulder, might be preserved from further change by being tanned. It seems to be only necessary that the articles should be kept 2 or 3 days in a warm solution of tannin.

Awnings may be treated in this manner with either oak bark, or sumac,—both will answer. This will afford a useful hint to our sail-cloth manufacturers.

Ocean Steamers.

Within a short time three new steam lines have been formed to connect Liverpool severally with Maine, New Foundland and New Brunswiek, and which will comprise 10 steamships as follows: Liverpool and Portland line 3; Liverpool, Glasgow and Montreal, 5; Liverpool and St. Johns, 2. The first mentioned will be semi-monthly. The pioneer of the line, the Sarah Sands, has already made her first trip.—The steamers of the Montreal line will measure 2,000 tons each, and one of them will be ready in June next. The line to St. Johns is projected by the proprietors of the St. Johns and Liverpool line of packet ships, which consists of eight vessels. The steamers now proposed are iron screw steamships, of 1,600 tons, to be bark-rigged, and to cost $250,000 each. They will each cross the Atlantic once a month, touching at St. Johns, New Foundland, on every trip.

Cast and Wrought Iron Rails.

It has been proposed to employ cast instead of wrought iron rails, on our railroads. The reasons given for the substitution of the former for the latter are, greater power of resisting crushing pressure; and also greater cheapness. The cast iron rail was the first and consequently it is the oldest. If the action of locomotives and trains upon rails was merely a crushing pressure, then the cast iron rail would be the best—but the action of a train upon the rails is frequently like that of a number of heavy and rapid blows upon an anvil. As cast-iron is very brittle, and breaks very easily during severe frosts by a blow, it would not be suitable in our climate during the winter season.

Pittsburg Statistics.

There are in Pittsburg and its vicinity seventeen large rolling mills; twelve principal or large foundries; twenty glass manufactories; about twenty engine and machine shops; five large cotton factories; four large flouring mills, besides some smaller ones; and it is estimated that there are more than one hundred steam engines in operation in the city and vicinity.

Cold in England.

By the last news from Europe, it appears that England has been visited with the severest cold ever recorded in history, namely, 4° below zero. A number of persons have been frozen to death, as no preparations are ever made by the people for such severe weather.

The New Patent Law of England.

By the new patent law of England, the heirs of a deceased inventor can take out a patent. This could not be done under the old law, if the inventor died between the periods of filing his application and the enrollment of the patent.

Tracing Paper.

A sheet of fine thin white paper dipped into a thick solution of gum arabic and then pressed between two dry sheets, renders the three transparent when dry; it is very useful for tracing purposes as it can either be written or painted upon.

There are on the earth 1,000,000,000 inhabitants; of these 33,333,333 die every year, 91,824 every hour, and sixty every minute, or one every second. These losses are about balanced by an equal number of births.

Elastic Varnish for Leather.

Take two parts by weight of resin, and one of india rubber, and heat them in an earthen ware vessel until they are fused together, after which they should be stirred until they are quite cold, a little boiled linseed oil may be added while the materials are hot.

If ivory becomes brittle by age, it will recover its original quality by being boiled in a solution of pure glue.

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New Inventions.

Improvement in Carriage Axles.

W. D. Titus and J. Atkiss, of Brooklyn, N. Y., have invented an improvement in carriage axles and their bearings. The nature of the invention consists, first, in making the journals of carriage axles of two cones arranged in a horizontal position, their apexes placed against each other, each of them being provided with a collar or shoulder, which fits snugly in either end of the hub and serves as a washer to prevent the escape of the oil. The outer of said cones being made movable, is fitted snugly over the square end of the journal after the wheel has been placed on the axle, and is held in place by means of a screw cap and spring catch, said devices serving to lock the hub and axle together. It consists, second, in providing the double conical journal box with an oil chamber formed round the two cones, and made to supply oil at the point where the apexes of the cones meet. The inventors have applied for a patent.

Rock Drill.

Anthony Frasier, of Sault Ste. Marie, Mich., has invented certain improvements in machines for drilling rocks, on which he has applied for a patent. The invention consists in placing the drill bar in a short sliding box, having one loose and three fixed sides—the loose side being so arranged and operated by a crank movement through a pitman, rocking pawl, and cam that its whole surface is caused to exert friction in a straight line upon the drill bar, which is thus firmly held between this and the remaining sides of the box, and is elevated until the upper end of the pawl coming in contact with an inclined plate, releases the bar, and it descends by its own weight. The box holding the bar is slightly turned during its upward movement by an eye-pin loosely inserted in its side, and the drill is thus rotated.

Improved Miter Box.

Caleb Willis, of Mystic Bridge, Conn., has invented an improved cast-iron adjustable Miter Box, on which he has applied for a patent. The nature of the invention consists in making a cast-iron miter-box capable of turning in any desired direction, so that it may be set to saw any angle between one of 45°, and a right-angle and to guide the saw in a vertical or inclined direction. Each of the guide pieces or boxes is provided with a slotted vertical follower, which rests on the back of the saw and guides or facilitates its operation.

Improvement in Printing Presses.

W. H. Street, of New York City, has invented a new device for attaching the blankets to the cylinders of printing presses. The present mode of attaching them is by sewing, and this method is liable to some objections. This invention consists in the employment, for the purpose specified, of a series of pins arranged within the cylinder, a toothed bar, and an outer and inner screw, by the action of which one end of the blanket is held while the other is attached to the cylinder, the screws being for the purpose of drawing the blanket to the required degree of tension. A patent has been applied for.

Improved Car Coupling.

T. B. Stout, of Keyport, N. J., has made application for a patent upon an improved car coupling, the nature of which consists in securing the lower end of the bolt which passes through the link between springs, in such a manner that the springs, when a car is thrown from the track, will be acted upon by a lateral movement of the bolt, caused by the pressure of the link upon it, and release the link from the bolt. This may also be done by a lever operated by the brakeman while the cars are in motion.

The Japanese as Inventors.

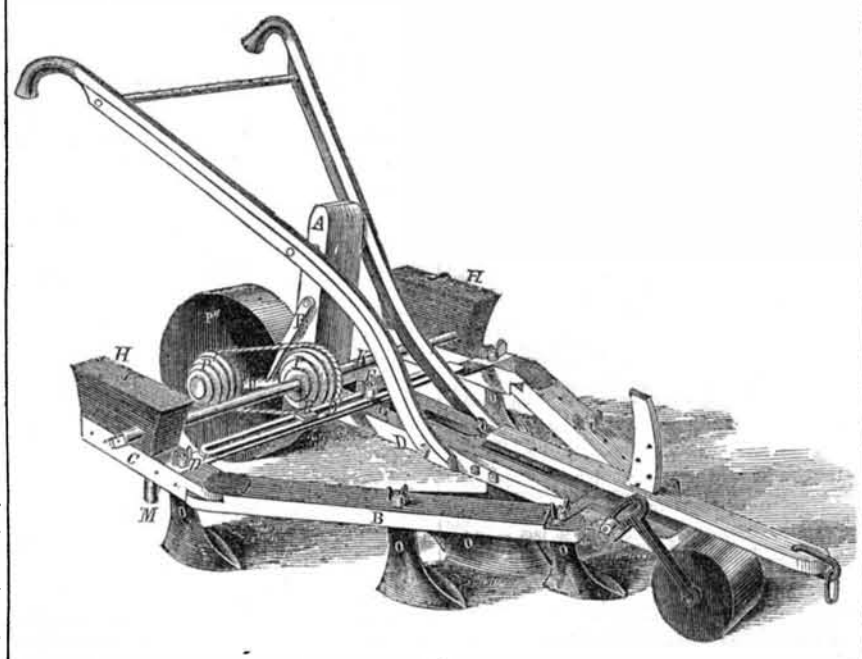
Bayard Taylor says "the peculiar talent of the Chinese is imitation. The Japanese do not content themselves with this, but are probably, next to the Yankees, the most inquiring race in the world, and would be inventors were it not for the restrictions of Government.

SEED PLANTING CULTIVATOR

The above engraving is a perspective view of an improvement in Seed Planting Cultivators, patented on the 15th Nov., 1853, by Geo. Phillips, 636 South Front st., Philadelphia.

The nature of this invention consists in so constructing and arranging the several parts of the planter and cultivator as to enable them to be separated or attached at the will of the operator, and to perform either of the functions for which they are designed, in an effective manner, and also in attaching to the upright post at the back part of the center or draught beam a graduating and driving wheel, capable of being either used for those purposes or as a pivot wheel on which to turn the machine when desired.

When the several parts of the machine are put together, so that it may form two furrows, thus planting two rows, the frame somewhat resembles in form the ordinary cultivator or an A-harrow, and consisting of a center draught beam, D, with jointed beams, B, connected with



the center-beam on either side of its front end by means of bolts upon which they move, and extending outward and backward from the same to near the rear, where they are jointed to additional beams, C, arranged parallel to the center-beam, and connected together by slotted bars, D′ D′, secured to the beams at right angles with them, one above the other, and kept thus by means of a stud, E, secured to the end of the lower bar, and passing through the slot in the upper one, and a bolt, F, passing through a longitudinal slot, G, in the center beam, D, and through the slots of both bars, D′ D′, and provided with a head below and a nut above, so as to enable the beams, C, to be moved to or from the center beam, according to the desired distance of the rows.

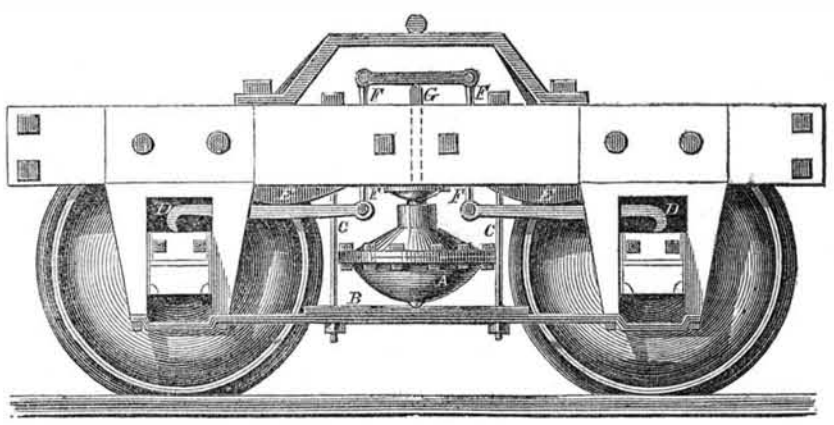
On top of the beams, C, are secured movable hoppers, H, for holding the grain, in which are placed rectangular blocks, forming the bottoms of the same and serving as rests for the ends of the horizontal tube, K. This tube is formed in two parts, one at each end, which are connected by an intermediate shaft. The ends which enter into the hopper boxes have perforations or cavities for receiving the required quantity of grain from the hoppers, to be dropped into tubes immediately below. These tubes are actuated by the belt passing over the pulleys, P P′. Shovel plows or ordinary drill teeth, O O, are arranged to open the furrows and cover the grain.

The ratchet, R, working in the pawl, Q, attached to the shaft of the graduating roller, P″, regulates the depth to which the rear plows will enter the ground, and the same purpose in front is accomplished by the similar wheel beneath the draught beam.

When it is desired to plant but one row at a time, the side beams, B, and one of the hopper boxes are detached, and the other is placed upon the center beam, D; or if it be desired to use it as a cultivator only, the hopper boxes and their adjuncts can be detached.

This is a very ingenious invention. Any further information can be obtained by addressing the inventor as above. One of these Cultivators is on Exhibition at the Crystal Palace.

IMPROVEMENT IN PNEUMATIC SPRINGS.---Figure 1.

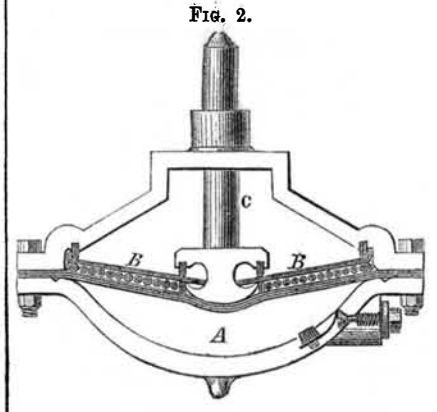


The engravings herewith presented represent an improvement in pneumatic springs, especially adapted to railway carriages, a patent for which was granted to Elijah Ware, of Roxbury, Mass. July 6, 1852. Fig. 1 is a side view of a car truck containing this improvement, and fig. 2 is a section of the spring.

This kind of car springs as previously constructed, consisted of a cylinder with a piston fitting very accurately within it, and working against the compressed air. The objection to this mode of construction has been that in order to render the spring air tight, it has been necessary to make the piston play very tightly in the cylinder which occasioned so much friction as to cause rapid wear, and consequently, a rapid destruction. In this improvement, these objections are obviated, as the piston instead of wearing on the sides of the cylinder has fitted into it a moveable diaphragm, which presses against a disk of rubber or some similar substance, which is forced against the air in a chamber beyond, this diaphragm having concentric rings placed on it to prevent the rubber from being worn. In pneumatic springs where a similar disk has been used, the piston has acted directly upon the rubber, which was consequently soon destroyed by its action.

S, in fig. 1 is the spring resting upon its support, B, C C, are bolts passing through the

Fig. 2.



timbers of the truck, sustaining this support.—D D, are levers against which press the boxes of the car axles. These levers working over the fulcrums, E E, act upon the connecting rods, F F, which by means of the cross bar at their top, press upon the piston rod G, and consequently compress the air in the chamber, A, fig. 2 below the diaphragm, B B. C, is the piston rod, being the lower extremity of F, fig. 1. It will be seen that between the upper part of the diaphragm and the lower portion or the rubber, there is arranged as before said, a series of concentric rings which protect the rubber from the action of the piston. The claim of the patent is upon this described construction of the diaphragm.

Locking Type Forms in Chases.

E. H. Sprague, of Zanesville, Ohio, has invented a new Chase Lock for locking up printer's forms. The form is locked by means of a combination of taper bars and wedges, with a compound lever or key, said bars being so arranged that the parallel side of one bears against the chase, and that of the other against the type, and their tapering sides against the wedge, by the action of which they are forced apart. Application has been made for a patent.

Heliographic Engravings.

We have received from M. Niepce de St. Victor, the heliographic steel engravings transmitted to us by the kindness of M. Gardissal. These engravings are, as will be remembered, etched by the action of light, and are not at any time touched by the hand of the engraver. The plates are very perfect, it scarcely seems possible that such an effect can be produced, yet M. de St. Victor assures us that they have not been re-touched. This art may yet be to that of the engraver what photography is to the painter.

Emery Sand Paper.

This kind of paper being made with glue, it is liable to be injured by moisture and water: a water-proof substance, as a substitute for glue, is therefore desirable. It has been proposed to use a solution of gum-copal in hot linseed oil, some turpentine, litharge, and dissolved india rubber. A cement made of these substances, we think, would answer a good purpose.

Brilliant Varnish for Leather.

Take 4 oz. shellac, half an oz. of lamp-black, and place them in a stone-ware vessel, into which pour about 1½ lbs. of alcohol, and cover it with a moist bladder. Let them be frequently shaken for about 24 hours. After this puncture the bladder, and add half an ounce of turpentine and leave the whole for about 24 hours longer. Repeated applications of this will crack the leather, but for some purposes it is very useful.

Improvement in Building.

In the construction of the new Pacific Mills in Lawrence, Mass., wooden pillars or supporters are used in the buildings. A hole is bored through the center of each of these supporters, about an inch in diameter, connecting at each end with the outer air, by means of a small perforation in the side of the post.—This admits a free circulation of air on the inside as well as on the outside of the wood; in this manner the wood is rendered much more durable, without any sacrifice of strength.

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NEW YORK, FEBRUARY 4, 1854.

The Length and Breadth of Steamships.

The sad fate of the steamer "San Francisco" has led to a tremendous amount of discussion in some of our Daily Papers. One writer attributes the cause of her disaster to this, and another to that defect, while a third attributes it to the want of a proper breadth of beam. From the discussion we have elicited one simple fact which deserves to be held up prominently before our nautical architects; that fact is the great difference of opinion which seems to be entertained respecting the correct relative proportions of the length and breadth of ships. There seems to be no fixed standard recognised with shipbuilders of what should be the breadth to a positive length of vessel. This shows us that there is still great room for investigation and experiment in this art. This question should engage serious attention, especially when we take into consideration our vast shipping interests, and the numerous disasters which have befallen so many of our sailing vessels and steamships during the past six months. One writer on the subject asserts, that the rule in the British Navy is to build ships, in the proportions of four times the length to the breadth, and he also asserts that *our* safest and best ships (the old Atlantic liners) are not five times as long as they are broad. These proportions he considers necessary, to impart steadiness on a stormy sea; and he condemns our new clipper ships for want of breadth,—considering them unsafe, *crank* and leaky. The "Great Republic," was built in the proportions of length to breadth as 7 is to 1—a very great departure from the proportions which used to prevail in ships that were built about twenty years ago; the breadth of beam then being a little over one-fourth the length. Some have held up the ark of Noah as affording the best proportions of length and breadth, namely, as 6 is to 1, but as that vessel was not built for making rapid voyages from one port to another, those who advocate such proportions, should give sound reasons for their correctness. Every steamship should be built with regard to speed, steadiness, strength, easy rise on the waves, comfort, and cargo capacity. These conditions involve more questions than the mere relative proportions of length and breadth; the form of the submerged section, is perhaps the most important question of all.

The question of length and breadth of steamships was discussed for some evenings before the Institution of Civil Engineers in London, during the month of last November. Some able nautical architects took part in that discussion, but the facts presented on the subject are of more importance than the opinions expressed. It was stated that as the length of steamships had been increased in England, there had been an increase of their speed, and at the present day the general length to the breadth was as 7 to 1, but some steamships far exceed this. One, "The City of Norwich," running on the German Ocean, was 183 feet long and 26 feet in the beam, with 200 horse power engines; her average speed was 10 knots per hour. Another running on the same route, named the "Tonning" was 222 ft. long, with 27 feet beam, having the same power of engines—200 horse—the average speed of which was 12 knots per hour. The latter vessel was of greater capacity than the former by 263 tons, and yet it was swifter, and was stated to be as steady and dry as her consort. The relative length to the breadth of the one was as 8·22 to 1, the other as 7·03 to 1. One steamer, named the "Wave Queen," has been built with the relative proportions of length to breadth, as 13 is to 1, and it was stated to be not only a very fast but a good dry sea vessel. These statements can be trusted; and they teach us that the whole discussion in our daily papers about the relative proportions of length and breadth of steamers—leaving other questions out of consideration—affords us no positive satisfaction whatever, and certainly no positive data for the adoption of a fixed standard applicable to every case.

The science of nautical architecture embraces a range of knowledge and practical experience far more extensive than any other whatever, and it is no wonder that there should be many different opinions among nautical men respecting certain questions relating to it.

It appears to us that the nautical architects of our city would find it to their advantage to organize a society for the purpose of reading papers and discussing questions connected with their profession. It is only by collecting and arranging ideas and facts relating to any art or science, that we can expect to improve and progress. We hope these remarks will lead to such results.

Etherizing Congress.

We see it stated in some of our cotemporaries that Dr. Morton, of Boston, is now in Washington, hard at work to get friends and favor among the Members of Congress, in order that he may obtain an appropriation from Congress for the discovery of Etherization in surgical operations.

On the 19th of February, 1853, Mr. Walker, Chairman of a Select Committee appointed by the Senate to whom were referred certain memorials in regard to the discovery of the means for rendering the human body insensible to pain during surgical operations, reported in favor of granting $100,000 to Dr. Morton. A Select Committee of the House of Representatives, of which Dr. Bissell, of Ill., was Chairman, presented a majority report in favor of Dr. Morton's claims, while an able minority report, by Edward Stanley, of North Carolina, and Alex. Evans, of Maryland, awarded the credit of the discovery to Dr. Jackson, of Boston.

In reviewing the claims of both applicants, we took occasion to express our views upon the injustice done to Dr. Wells, of Connecticut, now deceased, who had performed a surgical operation upon one person at least, when under the influence of ether, two years before Dr. Morton obtained a patent. Congress did not grant any appropriation for etherization because the claims of the applicants were altogether too conflicting. We hope that no appropriation will ever be made for any such purpose until the whole matter is sifted to the very foundation.

In the Reports of the Committees of both Senate and House of Representatives, evidence is presented which proves that neither Dr. Jackson, Dr. Morton, nor Dr. Wells were the discoverers of "etherization,"—that is, neither of these gentlemen originated the suggestion of rendering persons insensible to pain during surgical operations, by a gas or drug,—or even the first to employ such means in surgical operations. On the sixth page of Senator Walker's Report, it is stated that the Chinese surgeons used a preparation of hemp (haschisch) centuries ago, for rendering their patients insensible to pain during severe operations. On the 8th page it is also stated that in the 13th century, a liquid made by boiling opium, unripe mulberry, hemlock, mandragora, wood ivy, lettuce, and burdock, in water, was used by some surgeons for rendering patients insensible to pain, by applying it to the nostrils with a sponge as chloroform is now applied. In 1832 experiments, which were but a revival of the old plans, were made in France, and M. Dauriol specifies five cases in which he performed painless operations. Sir Humphrey Davy employed nitrous oxyd gas to relieve pain, and suggested its use in surgery. On pages 4, 5, 6, and 7 of the Report of Dr. Bissel, of the House Committee, a number of cases are cited of the employment of anesthetic agents in olden and modern times, before Drs. Jackson and Morton applied for a patent. These facts show that etherization was not a new idea, but the use of a particular agent—*sulphuric ether*—as a superior anodyne, perhaps was. The whole claims, therefore, of either Drs. Jackson or Morton, must rest upon the agent first employed by them, namely, sulphuric ether. The use of chloroform, therefore, is a different discovery, and the person who first applied it to surgical purposes, has as good claims to be considered a public benefactor, as the first person who used sulphuric ether.

These are our views upon this question, and we cannot for the life of us, see how any of the Committees of Congress, from the very information which they have presented in their Reports, could have come to any other conclusion—"Honor to whom honor is due."

Ocean Locomotion.

On land we require rails over which to run our locomotives; these are very expensive especially in such days of high-priced iron. We also require, to level down the hills and level up the valleys, in order to make a smooth pathway for our iron horses. The ocean, to be sure, is not very level during severe storms, neither does it afford a good foundation for rails, cross-ties, or sleepers; but no matter, there are those who are bound to make it a *race-course* if their words can do so. Here is Mr. Frost, of Worcester, Mass., who has devised a plan for an ocean horse to traverse the stormy Atlantic without *any head resistance;* and not to be one whit behind him, a certain M. Planavergue, a Prof. of Mathematics, in France, has published in "La Presse," his plan for a sea horse, which he says "will effect such a revolution in ships as was effected in locomotion on land, when the first sled was placed upon wheels." Our vessels plow through the water, and throw it out of their course; his is "to roll upon the surface, and over the sea with a train of cars,—outrunning the tempest, at the rate of 80, 90 and 120 miles per hour."

The constituent parts of his vessel are a great case, corresponding to the body of a carriage, with four large floating cylinders secured to its wheels. This case rests upon a strong frame, and is divided into stories—the lower story for the motive power, provisions, &c., and the upper for passengers and luggage. The cylinders upon which this sea-horse rests are made of boiler plates, having interior cells, the water being allowed to flow in behind but not in front, so that these cells become an air mattress, to buoy up the vessel. The inventor states that "when the engines are set in motion, the air becomes compressed in these cells in proportion as the velocity of the vessel is increased, so that instead of the resistance increasing according to the square or cube, it actually decreases." It is thus, he says, he is "going to gain great velocity by his air mattress, which will also enable his hydro-locomotive to mount over sand banks and waves, the same as if he were in a balloon."

How very foolish all this is; and how unscientific! He overlooks the fact, that the compression of the air in his cylinders, (by which he expects to overcome resistance), must be obtained by the exercise of steam power just in proportion to the amount of compression, and this will be exactly equal to the resistance, which he expects to obviate. This is the law of mechanics, relating to the question and is as plain as a pike-staff. No man of the least mechanical acumen, would propose such a clumsy marine-hog as a substitute for our present steamships. We have had some experience in this State already in such air-cylinders, on which to rest the hull of a steamboat. The "Cigar-Boat," which was built some seventeen years ago, near Troy, N. Y., on two conical air-tight iron trunks, shaped like cigars, was constructed to surpass all the steamboats on the Hudson River. The object of the air cones was to buoy up the hull of the vessel—to make it rest-like M. Planavergue's marine-horse, on an air mattress. But alas for human miscalculation and oversight, it made but one voyage, and the "Cigars" went out forever. It is the most foolish and unscientific notion in the world to suppose that any advantage can be obtained in the construction of marine vessels, by placing the load upon an air-mattress, composed of tubes, cells, or anything else. With an increase of buoyant material below the load, there must be a vast increase of resisting surface, the very evil which all nautical men endeavor to obviate.

Colt's Patent in Congress.

We had been under the impression that the patent of Col. Colt, the extension of which is now sought to be obtained by Congress, was the same for which an extension had been refused by Commissioner Mason; but we have learned with great surprise, that it is his older patent—which has been extended once already—the re-extension of which for seven years longer, by Act of Congress, is solicited. This patent was granted in February, 1836, extended in 1850, and will not expire until 1857. This method of trying to secure special legislation for prospective purposes—three years before a patent's term expires—does not look well. The reports from Washington, now confirm our former expressions on this case, namely, that the people will not permit their Legislators to vote for its extension. We believe there is but little doubt but this scheme is *dead*, but there are others, however, to be looked after equally glaring.

The Astor Library.

This Institution, so creditable to the founder and to our city, was opened to the public on the first of this month. It now embraces about 80,000 volumes, among which are many of great rarity and value. As our readers are probably aware, this is a Free Library—equally accessible to the poor as well as the rich; to the hard-handed mechanic no less than to the millionaire. No books are allowed to be removed from the building, but any one can be admitted to the rooms, which will be warmed in winter and lighted in the evening, where any work selected from the catalogue will be handed down by the librarian. Ample table room is provided—an oaken table extending entirely around the hall in the center of the alcoves. To these alcoves none are admitted besides the librarian. The catalogue embraces many scientific works of great interest, and we trust the mechanics of this city will not be slow to avail themselves of the privileges offered.

Ferry Boat Lights.

During the past week our city has been visited by dense fogs, by which the ferry-boats of our city, especially those running on the East River, have found great difficulty in making their regular trips. These fogs render our ferry navigation exceedingly dangerous; and when it is considered that perhaps no less than 75,000 persons cross between the cities of New York and those on Long Island, every day, the liability of accidents from collisions, &c., should be guarded against by every reasonable and approved means within the power of the Ferry Companies to apply. That so few accidents occur, is a subject of wonder, considering the very inefficient means provided to prevent them; thus, when on every ferry dock and boat there should be a strong brilliant light equal to that in the best lighthouse, there are only feeble glow-worm lanterns of the common kind, the light of which cannot be observed in a fog beyond the length of a decent-sized nose. It is a shame for our Ferry Companies thus to be so old-*fog*yish as not to employ the most improved lights of the present day. These old lanterns might have done very well twenty years ago, but they are entirely behind the present age, and should be discarded at once.

Petitions for Extension of Patents.

Coloring Maps—Lucius Stebbins, of Hartford, Conn., has petitioned for an extension of his patent for seven years, for an improved method of coloring maps, which will expire on the 12th of next March. The petition will be heard at the Patent Office at 12 M., on the 13th February.

Ore Crushing Machine—James Rowe, of Tampa Bay, Fla., has petitioned for the extension of his patent for seven years, on machines for crushing ores, which will expire on the 24th April, 1854. The petition will be heard at 12 M., on the 20th of next March, at the Patent Office.

Persons opposed to the above extensions must file their objections in writing twenty days before the time of hearing, in accordance with the rules of the Patent Office.

The Emmons' Patent.

We have been informed by Wm. W. Hubbell, Esq., of Philadelphia, the counsel for Mr. Emmons, Senr., that there never has been any collusion between the parties interested in the Woodworth and Emmons' patents, as we had been informed. This patent expired a number of years since; we are not aware of the machines being in use at present.

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General Remarks.—We shall this week close the series of articles which for so long a time we have devoted to the Crystal Palace; in so doing it may not be amiss to notice briefly the present condition and future prospects of the Exhibition.

In visiting the Palace a few days since, we were forcibly reminded of its condition during the first month after its opening in July: there are the same vacant aisles, the same confusion of boxes and litter; there may be heard the same sound of the hammer,—but there is one important difference—each day at that time added to the store of treasures of art, while now the confusion and the noise is the prelude to their removal, the token that in a few days more they will be no longer accessible to the gaze of the curious. Already many of the most interesting articles in the Exhibition have been removed. Probably one-half of the machinery in the arcade has been taken away. Powers' statues, acknowledged by all to be the most beautiful group in the Exhibition, are gone. The Gobelin Tapestries have been sent home. The splendid specimens of gold in the mineralogical cabinet, have been converted, we suppose, to a more legitimate purpose. Many, very many, of the miscellaneous articles have been removed by their owners.

But in another respect is there a very important falling off. The number of visitors now is not one-fourth of what it was during the autumn and early winter. Judging from two or three recent visits we should conclude that the receipts would but little more than cover the expenses, which must during this cold winter weather be extremely heavy. A stranger visiting the Palace for the first time and reading the regulation, "The Police will require visitors to move along when the passages become crowded," would be very much disposed to enjoy a laugh at the expense of the enterprise.

One thing to us appears evident, the Crystal Palace must change hands, or it will soon be numbered among the things that were, in spite of the intention of the Directors, circulated privately though not publicly announced, to the effect that it was to be kept open till the expiration of their charter. As it is now conducted it is evidently dying a natural death.

But this should not be. There is a public necessity for an institution such as this should be, in our country. With proper management it might be made not only highly interesting and useful, but what is equally necessary, profitable. It should be made a Museum of the Arts, and if properly arranged with such an object in view, it would continue to attract visitors from all parts of the country, and would therefore, as it has already done to a great extent prove a means of advertising to the exhibitors superior to any other, accessible with the same expenditure of money.

As it is, we must close these articles for the present, we shall however continue to keep our readers posted up in all matters of interest that transpire in relation to the Exhibition, and we sincerely hope that some measures will be taken to secure to our city and the country an institution capable of being so beneficial.

Calico Printing—We stated last week that we would soon present a few articles on "Calico Printing;" these will appear in the course of a few weeks with some illustrations.

In closing this series of articles, we cannot avoid expressing our thanks to J. E. Holmes, Esq., the Superintendent of Machinery, for the gentlemanly manner in which he has always aided us in our labor. To the other Superintendents of the Palace we are also indebted for favors.

The Ericsson has taken in her new engines, and is now out in the North River, the same as she was one year ago, and with as bright prospects.

French Taste in the Crystal Palace.

We must say of the French artists, whose handiworks have been exhibited at the Crystal Palace, that they display a taste and neatness from which our artisans would do well to take a lesson. The superiority of the French in this respect was one of the great facts to which the British Commissioners, subsequent to the closing of their Crystal Palace directed the attention of English mechanics. Of the various fabrics displayed at the London World's Fair, the French invariably exceeded the British in elegance, even when inferior in durability.—What is true of English manufactures, is true also of American. Our mechanics can make articles as strong as the French, but not as handsome. In the texture of the goods, the firmness of the furniture, they rival, perhaps surpass their French competitors; but our patterns do not display that taste and skill in design for which the French are so much distinguished.

The reason of this superiority is, that the French workman aims at being an artist as well as a mechanic. He is shrewd enough to know that it costs no more to make an article of an elegant pattern, than of an ugly one, and he consequently endeavors, from boyhood, to perfect his taste, by studying the best models. Is he a carpenter? He seeks the most elegant specimens of architecture, sketches them carefully, and preserves them in his portfolio. Is he an operator in a mill? He draws from nature the drooping vine-branch, the graceful rose-bud, the wavy outlines of foliage, the fantastic forms of the kaleidescope, and arranging them into various combinations, produces patterns of every variety, for de laine or silk. Is he a cabinet maker? Instead of spending his life in making stiff furniture, he continually invents new models, with flowing lines of beauty. Is he a manufacturer of table-ware or fancy articles? He makes elegance of form go hand in hand with stability. Whatever his peculiar walk of mechanics, he studies to do the best possible in that department, instead of being contented with remaining where his predecessors were, and slavishly imitating their works.

If a young man wishes to rise in the world, let him be an artist as well as a mechanic. If he wishes to be proud of his profession, let him render it an intellectual one, by studying art and applying it to his work. If he wishes to elevate the character of his country as a manufacturing one, let him strive to have it excel in the beauty of its various fabrics. A mechanic, who is an artist, elevates himself, his profession, and his country. A mechanic who neglects art, degrades all.

Sal-Ammoniac From Gas Works.

The Industrial Society of Mulhausen offers annually a number of prizes for inventions and improvements made during the year: and it also offers a prize to those who introduce a new branch of industry into the department of the Haut-Rhine. This last prize was taken by MM. Moerhlin and Stoll, who manufacture sal-ammoniac from the ammoniacal liquid of gas works. The main difficulty in the operation consists in separating the tar-like material which it contains. The following is the process adopted.

The ammoniacal liquid is mixed with slaked lime; then submitted to distillation in a boiler heated by steam; the parts volatilised pass into a worm, in which the larger part of the tar is deposited; the ammonia passes on into a Wolff's apparatus, where it leaves the foreign substances present, and finally is carried into cold water where it is condensed. In this state it is nearly free from its impurities; it is neutralized with chlorohydric acid and evaporated in a lead boiler. As it deposits it is withdrawn by means of a wooden rake; it is allowed to drain, and then introduced into a brick mould and subjected to strong pressure. Blocks of sal-ammoniac are thus obtained, which are dried in an oven heated by part of the heat furnished by the evaporating furnace.

The aggregate value of boots and shoes made last year in Massachusetts is $37,000,000, or more than all the other states combined—and far exceeding that of any manufacture in the Commonwealth

New Mode of Steam Repulsion.

A few days since an article was copied into your paper from "The Edinburgh Courant," giving an account of the new method of propelling vessels invented by Ruthven & Sons of Edinburgh. It was the fortune of the writer, in September last, to visit the company with the Hon. J. R. Chandler, the ship-yard of the Messrs. Ruthven at New Haven on the Frith of Forth, a few miles from Edinburgh, and inspect the vessel called the Enterprise, which was then nearly ready for the launching and which has since so successfully proved the advantages of this method of propulsion over all others.—We regard it as the greatest invention of the age and feel satisfied that by it the paddle wheel and screw will soon entirely be superseded. The Enterprise is a vessel of 100 tuns burden, and having an engine of 30 horse power. The propelling power is obtained entirely by means of the reactive force of water, a principal of hydraulics equally well established and well known. To illustrate, however, let us suppose a perpendicular tin pipe of say a foot in diameter and thirty feet in hight, and open only at the top to be filled with water. Now it is well known that the pressure of water near the bottom of the pipe will be the same on all parts of the pipe at the same level, but if a hole be cut in the side, of say an inch diameter, although the pressure is relieved at that point, it still remains the same as before at the point directly opposite of the hole so cut, provided you keep the water at the same level, and thus the equilibrium being lost, the pipe is driven along in a direction contrary to the escape of the water.—The fact can easily be illustrated by experiment. It is this simple principle which in the hands of science, genius and enterprise is without doubt destined to create a new era in navigation. In the application of this principle to navigation the power of the steam engine is substituted for the power produced by the weight of the water column. In the hold of the Enterprise there is an iron tank, of some eight feet in diameter and about two feet thickness, composed of two plates of iron screwed tightly together, and in shape resembling two large soup plates placed one over the other. This tank lies horizontally and below the water level, so that by means of apertures communicating with the bottom of the vessel, it is always full of water. From the center of this tank a perpendicular shaft rises, connecting the engines with a sort of wheel of very peculiar construction and having but two arms, which revolves within the tank and acting as a force-pump, drives the water through pipes on each side of the tank and through nozzles at the sides of the vessel, discharging it with great velocity just above the water level. The nozzles of the Enterprise are about eight inches in diameter, and when the vessel is going forward lie along and parallel to the sides, being about 18 inches in length and shaped like a "goose neck." They are moveable and are worked by a wheel on the deck of the steamer, and the speed may be increased or diminished by the position in which they are placed. If placed at right angles to the surface of the water, although the engines be working with full power, the vessel continues at rest. To stop the headway, it is only necessery to reverse the direction of these nozzles without stopping the engine.—In the trial trip of the Enterprise, she was brought to a dead stop in the space of 40 feet, although running at the rate of ten miles per hour, when the order to stop was given.

Again, by reversing one of the nozzles only, the vessel swings round precisely as if moving on a pivot.

The advantages of this method of propulsion over those of the wheel and screw are numerous, and it is reduced to a demonstration that with the same power of engines and the same amount of fuel consumed, the vessel can be propelled nearly one-third faster, as there is one-third gained, so that if the Collins steamers were provided with these improvements, they would cross in six days instead of nine days, saving, of course, three days consumption of coal, &c., while the whole paraphernalia of shafts, paddle-wheels and paddle-boxes would be entirely dispensed with.—[N. Y. Tribune.

[We have published the above to point out the want of correct information contained in it, in relation to the application of force in propulsion, in order that none of our people may be led astray by the principle described, and the incorrect statements made.

Three distinct things are pointed out in the above; first, the vessel is propelled by the reaction of a column of water; second, this water leaves the exit tubes at a *great velocity*, and above the water level; third, this vessel with the same amount of fuel, can be propelled one third faster than the Collins steamers. It is not true that a vessel propelled in this manner could cross the ocean in one third less time, as stated, than the Collins steamers, but must from, the very nature of the means of propulsion, require twice the time of one of the Collins Steamers to run from New York to Liverpool. The employment of water as a propelling agent for steamboats is not new; it was among the earliest plans proposed, and is the invention of James Rumsey, of Va., see an engraving of his boat, on page 112, Vol. 5, "Scientific American." To get the full value of the re-active force of water in propulsion, it (the water) should leave the tubes without velocity, consequently there is great loss of power in the arrangement described above, as all the velocity contained in the discharged water is a waste of force. The greatest amount of velocity that can be obtained by a vessel propelled by the re-action of water, is only 50 per cent. of the power applied. The whole science of mechanical engineering is founded on the remark attributed to Archimedes—"give me a place whereon to rest my lever, and I will raise the world." To propel any machine or carriage economically, a fulcrum for the lever is the first grand desideratum. If a steamship can be economically propelled by the re-action of a column of water, why not at once, without the use of a pump for such a purpose, propel it with the re-active force of the steam, and why not propel all our locomotives in this manner? The reason is obvious, a firm fulcrum for the propelling lever is required to do its work economically, and this lever must be a rigid substance, not a fluid. If we could suspend a cannon by a single thread of silk, and use a ball of the same weight as the cannon, the latter—if its form was as favorable—would be propelled backwards as far as the ball would be projected forwards. This would be the effect, according to the law, "action and re-action are equal." A man standing on a floating board cannot lift a weight to the same height as he could if standing upon terra firma. Every person knows this to be true. The propelling water, therefore, in the Messrs. Ruthven's boat, is projected into the air as into a sheath, and there is no proper resisting medium by which all the velocity of the water is applied to propel the boat. If the exit tubes were as large as the inlet tubes, no velocity, would be imparted to the vessel, because the water would leave the vessel as freely as it entered it. The whole amount of velocity obtained is due to the difference of the area, then, of the inlet and exit tubes. This arrangement, therefore, must involve a great loss of power. The boat seen by the above correspondent may be very useful for some purposes, but it does not economise power, neither is it so simple for reversing the motion of the vessel as a paddle-wheel. There is one good arrangement of the nozzles; that is, the employment of one when required, to turn the vessel, as can be done by a single oar. The idea is not new, as it respects paddle-wheel steamers, but it is not so easily carried out in them. It is time that the value of a firm fulcrum for moving bodies was better understood. A steamship can never be propelled with the same economy of power a locomotive, and for the same reason a balloon can never be propelled with the same economy of power as a steamboat. Every person is acquainted with these truths, they are applicable to all conditions and operations of boats; thus we expend more power in walking over swampy ground than on a smooth hard road, because the former is a yielding fulcrum the force of propulsion, while the latter is firm fulcrum.

The engineers are engaged in surveying a route for the Niagara Ship Canal—the starting point being Tonawanda.

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TO CORRESPONDENTS.

T. W. A., of N. Y.—There is no good practical work on mill building—one is much needed.

D. S. H., of Ind.—You can procure a good shingle machine by addressing J. D. Johnson, of Bridgeport, Ct., or Wm. Wood, Westport, Ct.

D. S. G., of Ill.—From the engraving of the drill published in last week's paper you can judge of its applicability to the purposefor which you want it: it is a good article. We cannot answer you about the tire iron.

L. T. R., of Mass.—There is no novelty or utility in your proposed method of shoeing brakes with lead.

R. B., of Ct.—There is no novelty in the idea of applying rollers to journals to relieve friction: this has been frequently done.

J. H. C., of Ohio—We are not acquainted with any plan for raising water in the manner you propose; its advantages are not apparent to us, and we do not think it possesses any patentable novelty.

John Garst, Dayton, Ohio—On the 23d ultimo we sent you $20—the amount your due on the Prize List,

A. W. B., of Ohio—Your plan for making lead pipe is exactly the same as that which is now generally practiced.

W. A. P., of Miss.—The plan you speak of, to ornament pillars, &c., is not patentable, because it is only a different application of a well known process. We do not believe that it would pay, for the gilding would soon wear off and it would not be possible to renew it again.

H. S., of Ind.—The suction which you speak of, to propel vessels, is the very thing which you should seek to avoid.

C. J. F., of Mass.—There is such an engine here as the one to which you refer, but it never will come into general use.

H. W. O., of Ct.—Fountain pens are well known—they do not supply the want which our article calls for. Yours embraces no patentable feature that we can discover.

T. J., of Miss.—Let no one deceive you about the Ericsson engine; just wait and watch. The traveling lecturer to whom you have referred has indeed disappeared from public notice. It is not to be regretted; such experiments do good in one sense if they do evil in another. We have perfect confidence in the antidote that we have administered to the public.

A. G., of N. Y.—We have carefully considered the description of your mode of signaling the approach and departure of trains; so far as we can understand it, without the aid of a sketch, we should think it different from any with which we are acquainted. Electricity has been employed for the same purpose, and contrivances operated by other means have also been proposed: you had better send us a model of your plan.

J. B. J., of Ind.—We do not think either of your inventions could be patented; the novelty is so very slight that we cannot advise an application.

A. J. M., of ——.—We will preserve your manuscript and it will be subject to your order for a month at least. We have great confidence in your theory: it is the same as the Chrono-Thermal system of Dr. Dixon—a work republished in this city by Dr. Turner: you should get a copy of it. We answer in the affirmative to your interrogation respecting the eye.

J. R., of V.—Use about one ounce to the gallon of water.

D. C., of N. C.—Your plan for supplying water to boilers is not new, we have seen the same plan nearly, a number of times, but it is not as good as the force pump.

C. J. F., of Ohio—Your plan respecting government agencies in different cities, for the purpose of protecting inventions, could not be easily carried out. You must never say "fail," but toil on and press forward—the reward will come some day. The buffers which you speak of, to lessen the destructive effects of collisions on railroads, have been proposed a number of times. We do not know of any plan like yours for rigging sails.

T. R. J., of Va.—Gypsum is not inoperative in the neighborhood of the sea as a fertilizer, so far as we can learn; we know the opinion is common that fish spoil rapidly when exposed to the rays of the moon, but this opinion may not be correct. What kind of ashes for agricultural purposes do you want.

N. R. G., of N. Y.—There is no good work published on woolen manufacturing in all its branches: such a work is much wanted.

A. S., of Vt.—The cheaper the pencil so much the better; but even if dear we think it should find a ready sale.

C. G., of Wis.—Purchase Smee's "Electro Metallurgy" and it will give you full information on the subject. The apparatus will not cost you more than $2.

E. A. H., of Ill.—We have examined your stove; it appears to be a good one, but so many stoves have been patented that it is almost impossible to give you any advice on the subject. Your movable grate we consider to be a good arrangement: we never saw one like it.

T. G., of N. Y.—Your plan is not the same as that which is on exhibition at the Crystal Palace, but we saw a boat on the Erie Canal ten years ago, with the same arrangement as yours—a wheel in an interior case.

M. G. C., of Pa.—In the year 1830 Com. Barron, of the Navy, secured a patent for an apparatus for ventilating bedrooms, etc, in hot climates, essentially the same as the one which you describe. There is no chance for a patent on yours.

W. L. B., of Mass.—There are no objections to the use of "Oscillating Engines," they are coming into use not only by the government, but also for manufacturing purposes.

E. P. H., of Me.—Such a stove as you speak of we think has been patented, but we do not remember the inventor's name—we have seen the stove.

J. M. U., of Ohio—We think your improvement in moulding flasks is new and patentable; you had better send us a model.

J. A. K., of Ct.—There can be no doubt but your invention is a good one, and you should secure a patent as soon as possible, it will not do to delay—is is too valuable to be left to take care of itself. The sooner you secure a patent, the less liability is there for legal contentions about priority. We speak for your benefit; you may take the advice or not.

S. C. W., of N. Y.—Let no man deceive you respecting your machine, it is of no value whatever, and can never be used for any good purpose.

R. J., of Ohio—The great danger to be apprehended from your gunpowder engine is, that it will never be of any benefit to yourself nor any other person, and involves a great leak in your pocket.

H. & R., of ——.—We do not know where to address you: we are every day receiving letters from persons wanting information, without the least intimation of their address—many letters are of a private nature and cannot well be answered through these columns.

L. S. W., of Md,—Use the eccentric for converting the rotary into rectilinear motion.

J. B. R., of Ala.—It is indeed true, as you say, that any improvement to lessen the running expense of locomotives is valuable, and more valuable when the ability of the engine is for running at high velocities with increased safety. We wish you success. If you try the cement, you will find out that it will not answer the purpose of gold. Your secret is safe so far as we are concerned.

D. D., of N. Y.—It will be very difficult for you to get the pieces of iron which you speak of, but if you write to Bogardus & Hoppin, of this city, they can furnish you with them if they can be furnished at all.

J. C., of N. Y.—White vinegar can be obtained at any of the druggists. All the receipts that may be of value to you will be found, from time to time—for the benefit of our readers—in the columns of the Sci. Am.

Money received on account of Patent Office business for the week ending Saturday, Jan. 28:—

A. A. S., of O., $30; A. R. H., of Pa., $25; P. Z. F., of R. I., $25; H. E. C., of N. Y., $35: E. H. P., of Ct., $10: W. M. U., of Vt., $25; J. McM., of Ky., $50; G. M. P., of Me., $30; N. F. T., of Tenn., $55: W. H. H., of O., $30; A. J. W., of N. Y., $25; F. & A., of N. Y., $25; L. C. C., of Ct., $20; J. H. R., of N. Y., $55; J. N., of Mass., $30.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Jan. 28:—

D. A. & A. J. H., of N. J.; J. C. R., of N, Y.: J. H., of N.Y: T. & A., of N. Y.; E. H. S., of Ohio; W. M. N., of Vt. J. McM., of Ky.; J. H. R., of N. Y:

A Chapter of Suggestions, &c

PATENT LAW, AND GUIDE TO INVENTORS—We publish and have for sale, the Patent Laws of the United States—the pamphlet contains not only the laws but all information touching the rules and regulations of the Patent office. Price 12 1-2 cents per copy.

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BACK NUMBERS AND VOLUMES—In reply to many interrogatories as to what back numbers and volumes of the Scientific American can be furnished, we make the following statement: Of Vols. 1, 2, 3, and 4—none. Of Vol. 5, all but six numbers, price, in sheets, $1; bound, $1,75. Of Vol. 6, all; price in sheets, $2; bound, $2,75. Of Vol. 7, all; price, in sheets, $2; bound, $2,75. Of Vol. 8, none comple, but about 30 numbers in sheets,, which will be sold at 50 cents per set; of Vol. 9, none previous to Jan. 1st, 1854.

GIVE INTELLIGIBLE DIRECTIONS—We often receive letters with money enclosed, requesting the paper sent for the amount of the enclosure, but no name of State given, and often with the name of the post-office also omitted. Persons should be careful to write their names plainly when they address publishers, and to name the post-office at which they wish to receive their paper, and the State in which the post-office is located.

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TO CORRESPONDENTS.—Condense your ideas into as brief space as possible, and write them out legibly, always remembering to add your name to the communication; anonymous letters receive no attention at this office. If you have questions to ask, do it in as few words as possible, and if you have some invention to describe come right to the business at the commencement of your letter, and not fill up the best part of your sheet in making apologies for having the presumption to address us. We are always willing to impart information if we have the kind solicited.

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IMPORTANT TO INVENTORS.—The undersigned having for several years been extensively engaged in procuring Letters Patent for new mechanical and chemical inventions, offer their services to inventors upon the most reasonable terms. All business entrusted to their charge is strictly confidential. Private consultations are held with inventors at their office from 9 A. M., until 4 P. M. Inventors, however, need not incur the expense of attending in person, as the preliminaries can all be arranged by letter. Models can be sent with safety by express, or any other convenient medium. They should not be over 1 foot square in size, if possible.

Having Agents located in the chief cities of Europe, our facilities for obtaining Foreign Patents are unequalled. This branch of our business receives the especial attention of one of the members of the firm, who is prepared to advise with inventors and manufacturers at all times, relating to Foreign Patents.

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LAWRENCE SCIENTIFIC SCHOOL—Harvard University. The next Term of this Institution will open on the second day of March, 1854, and continue 20 weeks. Instruction by Recitations, Lectures, and Practical Exercises, according to the nature of the study, will be given in Astronomy by Messrs. Bond, Botany by Prof. Gray, Chemistry, analytical and practical by Prof. Horsford. Comparative Anatomy and Physiology, by Prof. Wyman, Engineering by Prof. Eustis, Mathematics by Prof. Pierce, Mineralogy by Prof. Cooke, Physics by Prof. Lovering, Zoology and Geology by Prof. Agassiz. For further information concerning the School application may be made to Prof. E. N. HORSFORD, Dean of the Faculty, Cambridge, Mass. 21 4*

MATHEMATICAL AND OPTICAL INSTRUMENTS—The subscriber begs leave to bring to the notice of the professional community his new and extensive assortment of the above Instruments, which he partly imported direct from the most celebrated makers in Europe, and partly had manufactured under his own personal supervision. The undersigned would particularly invite attention to his very large and complete assortment of the justly celebrated Swiss Mathematical Drawing Instruments, for the sale of which, in this country, he has the sole agency, and which he can furnish at from $5 to $200 per case. Those Drawing Instruments received the prize medal at the London and New York Exhibitions. Orders from any part of the Union promptly executed, and price list sent if required.

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IRON DRILLS.—Portable drills for drilling iron.—They are the most simple and convenient drill in use, having a newly invented feed motion, simple and efficient in its operation. They are constructed of iron, and weigh 80 lbs. We can recommend them as a first rate article. Price $25. Address MUNN & CO., at this office.

JOHN PARSHLEY, No. 5 and 7 Howard st., New Haven, Ct., manufacturer of Machinists' Tools, and Steam Engines, has now finishing off 25 Engine Lathes, 6 feet shears, 4 feet between centers, 15 inches swing, and weighs about 1100 lbs. These Lathes have back and screw gear, jib rest, with screw feed, and the rest is so arranged that the tool can be adjusted to any point the work may require, without unfastening the tool, hence they possess all the good qualities of the jib and the weight lathe: they are of the best workmanship. Price of Lathe with count shaft and pulleys, $155 cash. Cuts, with full description of the lathe, can be had by addressing as above, post paid. Also four 30 horse power vertical Steam Engines with two cylinders. Price of engine with pump and heater, $800 cash. For particulars address as above. 19tf

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A. B. ELY, Counsellor at Law, 52 Washington street, Boston, will give particular attention to Patent Cases. Refers to Messrs Munn & Co., Scientific American. 16tf

LEONARD'S MACHINERY DEPOT, 109, Pearl st., and 60 Beeaver, N. Y.—Leather Banding Manufactory, N. Y.—Machinist's Tools, a large assortment from the "Lowell Machine Shop," and other celebrated makers. Also, a general supply of mechanics' and manufacturers' articles, and a superior quality of oak-tanned Leather Belting. P. A. LEONARD. 1tf

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Scientific Museum.

Anatomy of the Teeth.

A nerve, an artery, and a vein, enter the root of every tooth; "and all through an opening just large enough to admit a human hair."

The dental pulp is the termination of the nerve in the crown of the tooth. In the molar teeth it is about the size of a small shot. Some anatomists call the whole of the nerve the dental pulp.

The ivory of the tooth (that part which lies under the enamel) is composed of an immense number of little pipes, or tubuli, which make that part of the tooth porous. This accounts for the rapid decay of a tooth when the enamal is gone. The acids of the saliva, heat and cold, penetrate these numerous cells and cause a sudden destruction of the tooth. Filling the cavity solid with some metal is the only cure.

The nerve from one tooth connects with the nerve to every tooth in either jaw. This is the reason why the pain is so often felt on the opposite side from where the cause exists. Pain is often felt in the upper jaw, when the cause exists in the lower.

The superior (upper) molar teeth have three roots. They sometimes (not frequently) have four and even five roots, while the inferior (lower) have but two.

The bicuspids usually have but one root, or two united, so as to have the appearance of but one. They sometimes, however, occur with two distinct roots.

The incisors and eye teeth never have more than one root.

Constitution of Butter.

Heintz has communicated an elaborate paper on the constitution ot butter, the results of which are as follows:

The margaric acid prepared by Bromeis from butter is a mixture of stearic and palmitic acids.

The fixed fluid acid which is contained among the products of the saponification of butter consists chiefly of common oleic acid, and not as Bromeis believed, of a different acid. There is no butter-oleic acid. Butter therefore contains common olein.

Among the products of the saponification of butter there is found a fatty acid, the hydrate of which contains more than 38 equivalents of carbon to 4 equivalents of oxygen. This acid, butic acid, has very probably the formula C40 H40 O4. It is with great difficulty soluble in cold alcohol, and corresponds to a fat contained in butter which may be called butin.

Stearic acid is also contained among the products of the saponification of butter, though not in predominating quantity. Butter therefore contains stearin.

The largest proportion of the solid fatty acids in butter consist of palmitic acid. The largest proportion of the solid fats consists therefore of palmitin.

Concinic acid cannot be detected in butter.

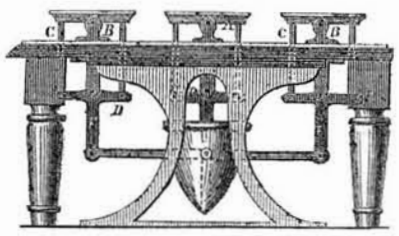
The portion of the solid fatty acids most soluble in alchohol consist of myristic acid. The presence of myristin in butter is therefore to be inferred.

Heintz points out the remarkable fact that in all the acids contained in butter, the number of equivalents of carbon and of hydrogen is divisible by 4. The same law holds good with respect to cocoanut oil. Heintz considers it therefore probable that the cetic and cocinic acids which he detected in small quantity in spermaceti are mixtures, since the numbers of equivalents of carbon which they contain are not divisible by 4 like those of the other acids in spermaceti: he proposes to resume the subject, operating upon 10 lbs. of spermaceti.

Separation of Nickel from Cobalt.

Liebig has found that when a current of chlorine is passed into a cold solution of the double cyanides of cobalt and potassium, the liquid being kept alkaline by the addition of caustic soda or potash, the nickel is completely converted into sesquioxyd and precipitated, while the cobalt remains in solution as unaltered double cyanid. The sesquioxyd of nickle may be washed and ignited, and the nickel weighed in the form of protoxyd; it is perfectly free from cobalt. The solution after passing the chlorine must still be alkaline. The smallest trace of nickel gives an inky black color when dissolved in cyanid of potassium, and treated with chlorine. This method of separating cobalt and nickel has perhaps some advantages over Liebig's second method which, it will be remembered, consists in boiling the mixed double cyanids with oxyd of mercury, which precipitates the nickel but not the cobalt.

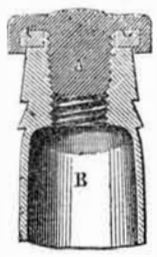
Equilibrated Ship's Tables.



A curious contrivance has been lately patented by Mr. John Sayers, of Poplar, England, in connection with ship furniture, such as tables and apparatus for supporting loose articles. With an ordinary table, the sea-going passenger constantly runs the risk of unshipping his teacup, or losing sight of his newly-charged cover at the dinner-table, from the lurching of the vessel, Mr. Sayers mitigates this evil, by arranging his tables so that their supporting surfaces shall always maintain their horizontal level.

The accompanying engraving represents an end view of a ship's dining-table thus fitted, and placed fore-and-aft. At A are small tables, or platforms, supported at each end on hinge joints, B, attached to the table framing; and to the under sides of these tables, A, are attached the vertical pieces, C, sliding freely through the holes in the fixed top of the table framing, and resting on the ends of the angular suspension pieces, D, beneath. These suspension pieces are carried on hinge pieces, E, fast to the underside of the ordinary table top. From the centre of the suspension pieces, D, arms, F, project downards to carry the weight, G. It is evident that the surfaces, A, which are the supporting platforms for the loose articles in use, are thus kept at their exact level under all circumstances of the ship's motion, just as the common lamp or compass is sustained upon its universal joint.

Screw Stoppered Bottles.



This is a contrivance for improving upon the old, ineffective, and very inconvenient system of closing bottles by corking. A screw-thread is moulded on the inner surface of the bottle-neck, or opening, at the time of moulding the neck; and into this screwed neck is fitted a correspondingly screwed stopper of wood, glass, earthenware, or other convenient material. This stopper is formed with a suitable head to facilitate adjustment, and its entering portion is screwed externally, to correspond with the internal screw in the neck—whilst beneath the expanded head is a groove, containing an annular jointing piece of some soft or elastic material, as gutta percha, india-rubber, canvas, or other substance. In this way, when the stopper is screwed into the bottle, this elastic surface bears down on the end surface of the neck, and preserves a light junction. Such stoppers are easily screwed in and out, whilst they are always present for use, and will last as long as the bottle.

The figure is a longitudinal section of the neck of the bottle, with the stopper in its place. The bottle, having been blown in the usual way, and being separated from the punty, a small quantity of semifluid glass is taken upon the neck to form the mouth, the bottle being held by its bottom end. The workman there introduces the screw, into the neck, and when entered up to the shoulder, he closes the shears, and turns the bottle round rapidly on his knee, the rotation forming the smooth outside of the mouth, whilst the pressure forces the glass into the thread of the screw. The stopper, A, in this view, is formed with an external screw-thread, corresponding to the internal one in the mouth of the bottle, B; and beneath the expanded head is a ring, C, of india-rubber, gutta percha, or other elastic substance, let into an annular groove in the head, and forming a tight joint. Quite an ingenious invention. It is patented in England by Joseph Scott.

Gold Assaying in South America.

The process of gold assaying amongst the native miners of South America is very simple.—A fragment of quartz is pounded, and rubbed to powder between two pieces of granite. A bullock's horn, of black color, is the only assay instrument. It is cut longitudinally into two equal pieces, partly on the curve, so that one half forms a kind of long spoon, the inside of which being polished. The powder being placed in the spoon, the water is poured in it and shaken, and then poured off. A second and a third water being applied, nothing is left but the coarser particles at the bottom, and at one edge of them, conspicous on the black horn, is seen a fringe of gold powder, if gold be present. With a keg of water at his back, and his spoon in his wallet, and a little parched meal, the mine hunter wanders among the barren rocks in search of a treasure, which he sells when discovered, and seeks another; the claims of labor being practically regulated by natural aptitudes. The man who buys the mine, digs the ore, breaks it up into the size of walnuts, loads it into hide sacks, borne on mules, and sells it to the "beneficiador," or benefitter, in the valley below, who passes it through his mill. Having settled upon a small stream, with a fall from four to five feet, he builds up two walls to enclose it on each side, and a back wall to form a small reservoir, with a spout and plug to let out the water at his plaesure. Over the side walls, with considerable labor, he contrives to lay a flat circular granite stone, some five feet in diameter, with a hole of some fifteen inches through the middle. The middle of the stone is hooped round with staves, which stand up eighteen inches in the form of a tube. The outside is surrounded with similar staves, so that a water-tight circular trench is formed, with a granite bottom. Through the central hole is passed the straight stem of a tree, shod with an iron pivot, standing on an iron shoe, fast to a block below. The upper part of the tree is steadied in a beam above, supported by two upright posts. Through the middle of the vertical shaft is a horizontal hole, with a horizontal shaft projecting on each side. In this horizontal shaft, at nearly the level of the foot below, are affixed in a circle, like the spokes of a wheel, a number of wooden spoons, about three feet in length. To the horizontal arms above are tied, by raw hide cordage, a sort of large flag paving stones, with their faces bearing on the flat granite below. The water being turned on the spoons, the paving stones are drawn round by the motion of the shaft, and grind the quartz.—An improvement on this is to use two vertical roller stones, eighteen inches thick and five feet in diameter, with a circular hole in the centre, through which the horizontal shaft or arm passes, and forces them round. As the stones vary in their speed on the inner and outer edges, there is a grinding as well as a crushing process. When the machine is at work, a quantity of quicksilver is thrown into the trench, and the quartz with it. A small stream of water runs in, and at one portion of the rim there is a hole for it to run over, which it does, carrying the floating mud with it. As it runs over, it falls into a goat-skin, with quicksilver at the bottom. Out of this goat-skin it falls into a second, with more quicksilver, and so on from one to another, according to the amount of fall. When the quicksilver is supposed to be saturated, the mill is stopped, the quicksilver is taken out of all the receptacles, and poured into a linen bag of fine texture, and three or four thicknesses. The quicksilver is squeezed through this bag, and the thickening amalgam is finally rammed down with a sort of rolling pin.

A Steep Railroad Grade.

The steepest railroad grade in Europe, is upon the Piedmontese Railroad, between Turin and Genoa. It is near the town of Gleni, and the ascent is 185 feet to a mile! Experiments which have been made have shown that two locomotives, drawing a train of six loaded gravel cars, weighing altogether 100 tons, ascended the grade at a time when the rails were exceedingly wet and slippery, at a speed of nineteen miles an hour.

A Spiritual Machine.

We learn that Mr. J. T. Pease, of Thompsonville, Connecticut, has succeeded in inventing a machine which he denominates the Spiritual Telegraph Dial. This apparatus is contrived with a dial face, on which are marked the letters of the alphabet, the Arabic numerals, the words Yes and No, and some other convenient signs. A moveable hand, or pointer, is fixed in the centre; and when a ghost wants to communicate with its pupils and friends in the body, all that is requisite is for it to give a gentle twitch to the pointer, and the revelation is accomplished. Mr. Pease states that with a good tipping medium to facilitate the movements of the pointer by agitating the table, letters will be indicated to the dial as fast as an amanuesis can write them down. There is also an arangement by which the dial may be concealed from the sight of the medium, so that he cannot know what it is that is being said by the ghost.—[Exchange.

[Will Mr. P. interrogate his machine respecting the future of the Ericsson, and send us the result of his observation. If he will foretell the destiny of this ship we are ready to endorse his invention, but until we see some such evidence of its skill we must remain chary of it.

Preparation of Ferrocyanhydric Acid.

Liebig gives the following simple method of preparing this acid. When a cold saturated solution of ferrocyanate of potash is mixed with its own volume of fuming muriatic acid added in small portions at a time, a snow-white precipitate of pure ferrocyanhydric acid is thrown down. These are to be washed with muriatic acid, dried upon a brick, and dissolved in alcohol; from the alcoholic solution the acid may be obtained in beautiful crystals.

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